PAINT and VARNISH

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHES

Continuing research has made LX-685 NEVILLE'S most versatile resin

In the few short years since it was introduced, Neville LX-685 has been employed with evident success in the preparation of an ever expanding group of products. A partial list of the uses for this versatile resin is given below. If one of these applications is related to your product line, and you are not using LX-685, it might well pay you to write for literature or ask us for a sample. The Neville Technical Service Laboratory developed many of the present successful uses . . . perhaps it could help you too.

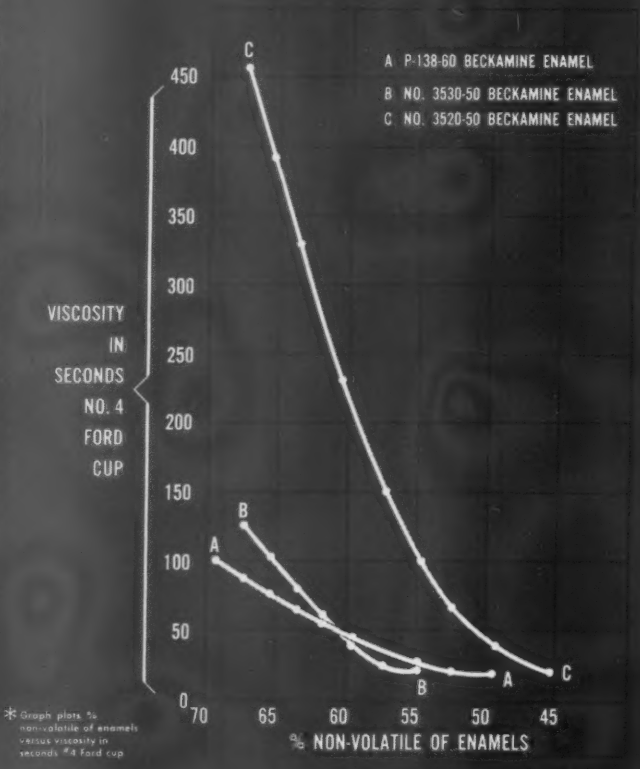
Present Applications: Aluminum Paints, Brake Lining Compounds, Concrete Curing Compounds, Concrete Paints, Deck Enamels, Floor Paints, Gasket Stock—Oil Resistant, Gasoline and Grease-Proof Coatings, Gold Lacquers, Government Specification Coatings, Metal Coatings, Paper and Hardboard Impregnants, Pipe Coatings, Porch Enamels, Primers, Printing Inks, Shoe Soles—Cork Filled, Shoe Sole Compounds—GR-S, Slab Sole Stock, Traffic Paints

NEVILLE®

Neville Chemical Company

PITTSBURGH 25, PENNSYLVANIA

*Viscosity Curves of ENAMELS made with high, medium and low viscosity BECKAMINES



* Graph plots % non-volatile of enamels versus viscosity in seconds #4 Ford cup

For Your Alkyd Enamels –

RCI Beckamine and Super-Beckamine Resins

The above graph gives you an example of the useful type of information you will find in the current RCI booklet on urea and melamine resins. The graph compares the reduction rate of typical low, medium and high viscosity BECKAMINES in a standard white gloss enamel formulation.

If either a urea or a melamine resin is the sole vehicle of an enamel, a very hard brittle film results. Therefore, it is normal practice to combine the urea, or melamine, with a suitable alkyd resin. This succeeds in (1) plasticizing the urea or melamine to improve adhesion and flexibility; or (2) modifying the alkyd with the urea or melamine to improve hardness, color, gloss and resistance to chemicals.

Since ureas and melamines are used in amounts constituting from 5% to 50% of the total vehicle solids for most industrial finishes, we consider the problem from the second point of view; that of modifying the alkyd. Economically, urea resins improve alkyds without greatly increasing final cost since urea prices are in the same range as alkyd prices.

Melamine resins are higher priced but melamines improve alkyd properties materially more than do urea resins.

If you are formulating automotive primers and body enamels, truck and tractor enamels, toy and implement enamels, or wood and metal furniture finishes, you can depend on the wide range of RCI BECKAMINE and SUPER-BECKAMINE resins to provide a product suited to your specifications. Write to RCI today for full information. Ask for *Amine Booklet*.

REICHHOLD

Synthetic Resins • Chemical Colors • Industrial Adhesives • Phenol
Hydrochloric Acid • Formaldehyde • Glycerine • Phthalic Anhydride
Maleic Anhydride • Sebacic Acid • Ortho-Phenylphenol • Sodium Sulfite
Pentaerythritol • Pentachlorophenol • Sodium Pentachlorophenol
Sulfuric Acid • Methanol

REICHHOLD CHEMICALS, INC.,
RCI BUILDING, WHITE PLAINS, N.Y.

Creative Chemistry...Your Partner in Progress

RCI

PATTERSON

mills help produce "loaded" paints at THE O'BRIEN CORPORATION

O'BRIEN symphonic color paints are loaded with extra pigments for true colors and unusual quality—requiring intimate and uniform dispersion in manufacture. PATTERSON MILLS produce for The O'Brien Corporation a uniform grind in the shortest possible time, and contribute to maximum color brilliance with lack of contamination. Add to these advantages Patterson's typical low operating cost, trouble-free operation and long service life, and you have *the sum of satisfaction!* Let us quote on your grinding needs.

ADVANCED
PROCESS EQUIPMENT
OF ENDURING SATISFACTION

THE *Patterson* FOUNDRY AND MACHINE COMPANY

A Subsidiary of Ferro Corporation

East Liverpool, Ohio

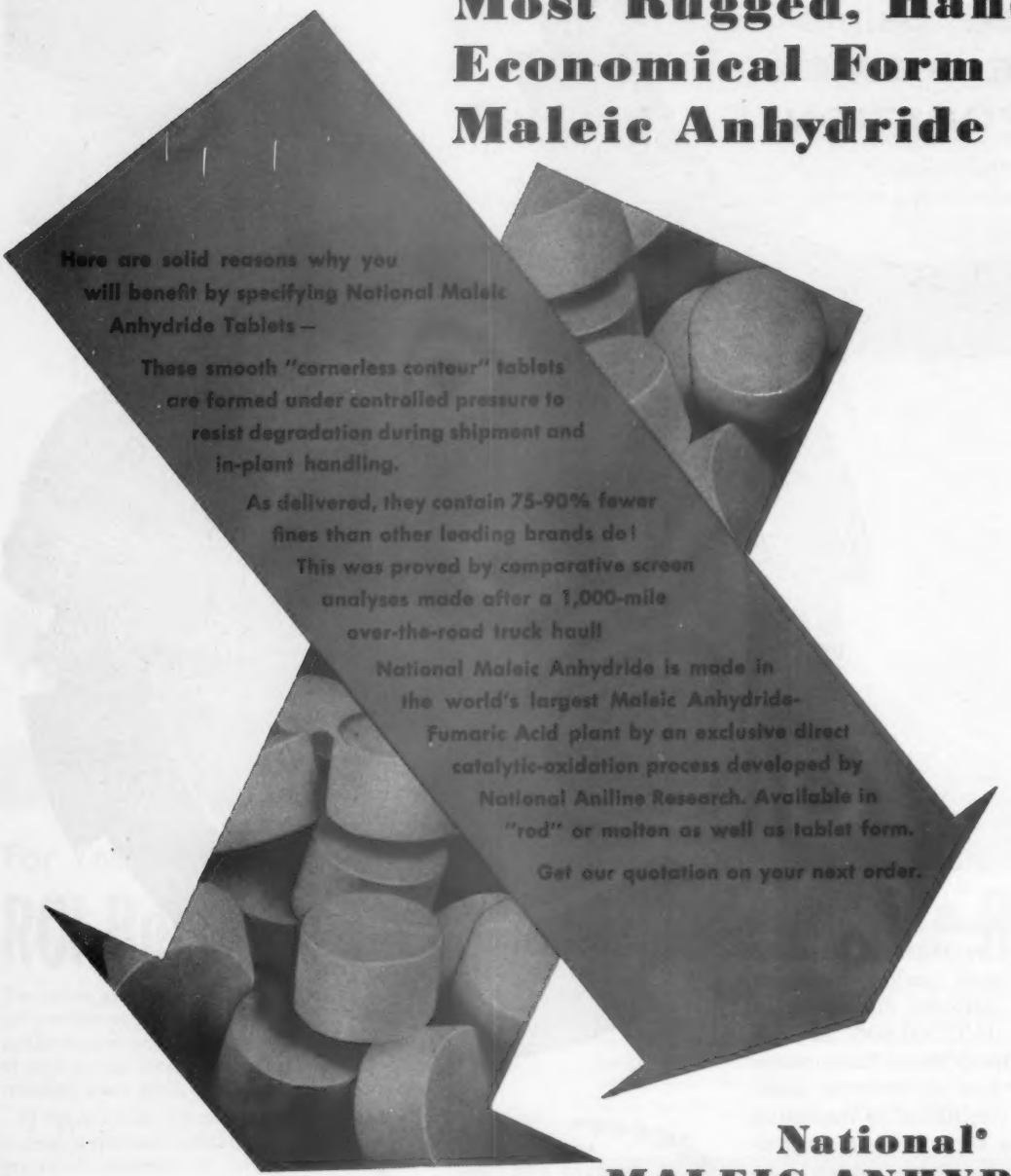
THE *Patterson* FOUNDRY AND MACHINE COMPANY (CANADA) LIMITED

Toronto, Ontario

Originated by Resin-Chemical Headquarters

and still the

Most Rugged, Handy, Economical Form of Maleic Anhydride


Here are solid reasons why you will benefit by specifying National Maleic Anhydride Tablets—
These smooth "cornerless contour" tablets are formed under controlled pressure to resist degradation during shipment and in-plant handling.
As delivered, they contain 75-90% fewer fines than other leading brands do! This was proved by comparative screen analyses made after a 1,000-mile over-the-road truck haul!
National Maleic Anhydride is made in the world's largest Maleic Anhydride-Fumaric Acid plant by an exclusive direct catalytic-oxidation process developed by National Aniline Research. Available in "rod" or molten as well as tablet form.
Get our quotation on your next order.

National® MALEIC ANHYDRIDE Tablets

Allied Chemical

NATIONAL ANILINE DIVISION

40 RECTOR STREET, NEW YORK 6, N. Y.

Akron Atlanta Boston Charlotte Chattanooga Chicago Greensboro Los Angeles
New Orleans Philadelphia Portland, Ore. Providence San Francisco Toronto

PAINT and VARNISH Production

(REG. U.S. PATENT OFFICE)

Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOL. 48 AUGUST, 1958 NO. 9

A NEW LOOK

Beginning with the September issue, *Paint and Varnish Production* will undergo a complete change in format to better serve you, our readers. Coupled with this change, two new departments will be included in our regular monthly issues; one dealing with foreign paint developments (Russian developments will be discussed in September), the other on paint manufacturing techniques.

It is our feeling that this "new look" will not only make for livelier reading, but also, in keeping with our policy, enhance the editorial value of *Paint and Varnish Production*.

Copyright © 1958
Published Monthly by
Powell Magazines, Inc.
Executive and Editorial Offices
855 Ave. of Americas
New York 1, N. Y.
BRyant 9-0497

JOHN POWELL, *Publisher*

ANTHONY ERRICO, *Editor*

ALAN P. DANFORTH
General Manager

ABRAHAM MANN
Production Manager

HOWARD N. SCHWARTZ
Editorial Ass't.

ROBERT B. ABBOTT
Circulation Manager

PHILIP J. SEAVEY
Advertising Manager

DUNCAN P. MACPHERSON
700 S. Washington Sq.
Philadelphia, Pa.
LOmbard 3-9982

W. A. COOK & ASSOCIATES
161 E. Grand Ave.
Chicago 11, Ill.
WHitehead 4-2260
Advertising Representatives

MCDONALD-THOMPSON
West Coast Representatives

FEATURES

New Tool for Evaluating Sagging of Paint, *by W. W. Reynolds and E. C. Larson* 31
Silicone Resins for Cold Blends 38
Conveyorized Paint Warehouse 42
Leasing Equipment in the Paint Industry, *by Clarence C. Kane* 46
The Coating Corner, *by Phil Heiberger* 85
Production Tip—Air-Motored Agitators 90
Invoice Accounting Plan, *by Eugene T. Lyda* 91

DEPARTMENTS

Comment 7
News 51
- Beige Gaining in Popularity 55
- Kiddie Conducts Survey on Write-Offs 56
- Paint Show and Technical Program Announced 88

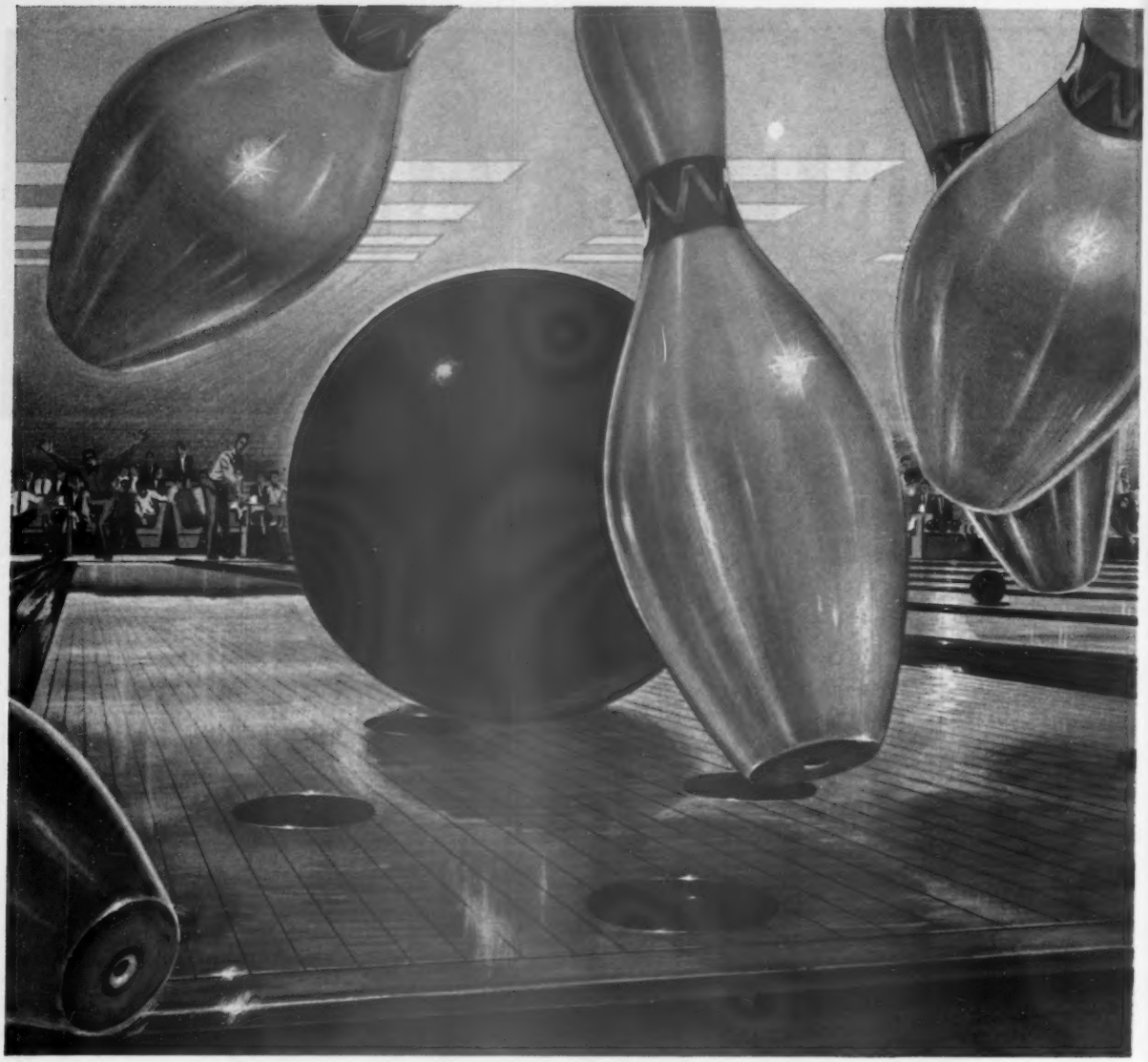
New Raw Materials and Equipment 59
- Change-Can Mixer 63
- Universal Vehicle 64
- Ultraviolet Absorber 65

Personnel Changes 67
Patents 73
- Spray Coating Apparatus 73
- Latex Paint 73
- Water-Soluble Shellac Powder 74

Abstracts 80
Technical Bulletins 93
New Books 97
Calendar of Events 97

MEMBER BUSINESS BPA PUBLICATIONS AUDIT, INC.

PAINT and VARNISH PRODUCTION is published monthly except semi-monthly in March at Easton, Pa., by Powell Magazines, Inc., John Powell, president; Ira P. MacNair, vice-president and treasurer; Alice L. Lynch, secretary. Entered as second class matter at Post Office at Easton, Pa., Jan. 30th, 1952, under the Act of March 3, 1879. SUBSCRIPTION RATES POSTPAID: *United States and Canada*, 1 year $3.00; 2 years $5.00. *Mexico and Pan-American Countries*, 1 year $4.00; 2 years $7.00. All other countries, 1 year $8.00; 2 years $15.00. Remit cash in advance, with order, by bankers draft on New York funds. SINGLE COPIES: *Current issue*: $0.50; *all back numbers*: $1.00. Convention issue: $1.00. Bound volumes: $10.00 per vol. when available. We cannot guarantee to supply back numbers and claims for missing numbers cannot be granted if received more than 60 days after date of mailing. Subscribers should promptly notify circulation department of any change in address, giving both old and new addresses and by sending address label. EDITORIAL AND EXECUTIVE OFFICES: 855 Avenue of the Americas, New York 1, N. Y. BRyant 9-0497. Printed in U.S.A.



For the finest in finishes—

specify Shell Chemical products for surface coatings

FOR MANY YEARS, manufacturers of decorative and protective surface coatings have depended on Shell solvents and resins for quality and economy.

Shell's family of solvents assures you complete formulating flexibility . . . meets or exceeds highest standards.

Shell Epon® resins produce finishes that offer outstanding resistance to abrasion, impact and chemical attack.

In the production of alkyd resin and ester gum coatings, *Shell glycerine* provides outstanding quality and performance.

For information and technical literature on specific products, write us now.

Acetone
Bisphenol-A
Diacetone Alcohol
Di-Tertiary Butyl Peroxide
Epon® Resins
Ethyl Alcohol
Ethyl Amyl Ketone
Glycerine
Hexylene Glycol
Isopropyl Alcohol
Isopropyl Ether
Mesityl Oxide
Methyl Ethyl Ketone
Methyl Isobutyl Carbinol
Methyl Isobutyl Ketone
Neosol® Proprietary Solvent
p-Tertiary Butyl Benzoic Acid
Secondary Butyl Alcohol

SHELL

SHELL CHEMICAL CORPORATION
CHEMICAL SALES DIVISION

Atlanta • Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • New York • San Francisco • St. Louis
IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited, Montreal • Toronto • Vancouver

Editorial Comment

Versatile Styrene

STYRENE has a rosy future as a paint chemical, according to John C. Weaver, vehicle-research coordinator for Sherwin-Williams Company.

In an address before the annual spring meeting of Commercial Chemical Development Association in Niagara Falls, Mr. Weaver predicted that styrene promises to become one of the most important paint components in the future, because it gives a fine balance between low cost and high performance in toughness and hardness. He said—

"Just as rosin was the great hardener and cheapener of paint in the first half of this century, so will styrene and its near relatives such as vinyltoluene, take an important place in paint in the second half of the century. The comparison between styrene and rosin is especially meaningful because neither one alone is capable of creating a top quality paint for practically any purpose. Yet, in their respective half centuries, each has been very abundant at low cost and each has been very versatile in formulation. Although prophets keep forecasting the death of wood rosin and the removal of all rosin from paint, there is still upwards of 50 million pounds of rosin used in paint directly and more than that indirectly as so-called synthetic resins. This is likely to continue until a rising generation of resin and varnish chemists is not required to learn paint formulation with rosin, and instead learn many versatile uses of styrene".

In discussing the versatility of styrene outside the latex emulsion field, Mr. Weaver pointed out the many successful applications of this monomer such as a copolymer with oils and alkyds, and more recently in thermosetting solvent type appliance finishes based on styrene and various comonomers. Another field where styrene will be used extensively is in the polyesters, particularly for solventless furniture finishes. Such finishes have unsurpassed toughness, beauty and durability which, according to Mr. Weaver, can be achieved at a reasonable cost. The possibility of extending polyester finishes to wood used in construction was also foreseen by Mr. Weaver.

Based on these predictions, it may not be a bad idea for all vehicle chemists to brush up on their styrene chemistry; for this is one chemical that is readily available from the evergrowing petrochemical industry—and at an attractive price.

Paint Eases Traffic

PAINT is helping to speed traffic, ease bottlenecks and promote safety in New York City. New York's Traffic Commissioner Wiley states that the use of white paint is one of the most versatile and least expensive method for controlling traffic in and about the City.

Making roads "wider" with paint is one answer to the problem of handling heavier volume on roads with fixed dimensions. It has been discovered that with three lanes on each side of the center line, and no lane marker, motorists tend to use about two and one-quarter lanes.

Instead of following directly behind each other, cars go a bit to the left or right in a "ladder" pattern. Thus, when dash lines are used to make three lanes 8½ to 10 feet wide, cars stay in line and use two and three-quarter lanes, an increase of 22 per cent.

It has been estimated that some 2,000 miles of white paint will be used in this traffic control program, representing a volume of some 40,000 gallons of paints for one treatment. Heavily traveled routes will require three treatments per year.

We are all well aware of the mounting traffic hazards which are occurring on our nation's highways and roads. New York's success with paint in helping to reduce these hazards is another example of the value of paints in maintaining safety.

Lytron 680 *based paints*

are exceptionally durable with excellent color retention, slow chalking, high resistance to oxidation

Painters like the way Lytron 680 based paints eliminate problems they face. There's no rupturing on porous substrate, no color mottling or spotting. Blistering—even over green masonry—is minimized.

Controlled small particle size assures proper binding of high volumes of pigment and the stable films formed have excellent adhesion, color retention, and resistance to alkalinity.

Lytron 680, a unique acrylic type polymer, forms smooth flexible films even below 40°F., without modification! The films are water-resistant in 30 minutes, exceptionally durable, and resistant to oxidation on weathering.

SPECIAL NOTE TO MANUFACTURERS OF INTERIOR PAINTS: Although Lytron 680 was developed as a binder for exterior paints, features have been incorporated which make it equally useful as a sole vehicle or as a modifier of other alkaline latex vehicles in high quality interior paints. Small quantities of Lytron 680 added to alkyd or styrene butadiene systems can improve early water resistance, adhesion, durability, flexibility. Be sure to investigate this low-cost way to gain the superior properties of Lytron 680.

For evaluation samples, price schedules and technical data on Lytron 680, write Monsanto Chemical Company, Surface Coating Resins Dept., Springfield 2, Mass.

Monsanto

Other Monsanto products for the surface coating industry include Amino Resins, Phenolic Resins, and Styrene Latices and Resins.

*LYTRON: REG. U. S. PAT. OFF.

From CARBIDE'S Solvent Center . . .

Solvents to fit your formulation —just specify the properties you need

Among the high-quality glycol-ethers, esters, alcohols or ketones available from CARBIDE, there is one—or a combination—that is just right to give your product the best balance between cost and performance.

Your solvent might be one—or several—of CARBIDE's 11 CELLOSOLVE and CARBITOL glycol-ethers. Their non-foaming property, high solvent power, low viscosity and low degree of odor make this group of solvents suitable for use in easy-spreading, color-retaining latex paints. If you use esters in your formulation or process — you have a choice of 25 CARBIDE esters — for example, ethyl acetate, isopropyl acetate, or butyl acetate. And, for a wide range of applications—from lacquers to drug extraction—there are two dozen alcohols and 14 ketones available from CARBIDE.

Whatever your product, there is a trained Technical Representative ready to help you select the solvent that's best for your application. You can balance your inventory and production schedules by ordering the quantities you need, quickly shipped in drums—LCL or carload lots, in tank wagons, in compartment tank cars, or 4,000 to 8,000-gallon tank cars from one of our warehouses, bulk storage stations, or plants—a total of 72 shipping points—across the country.

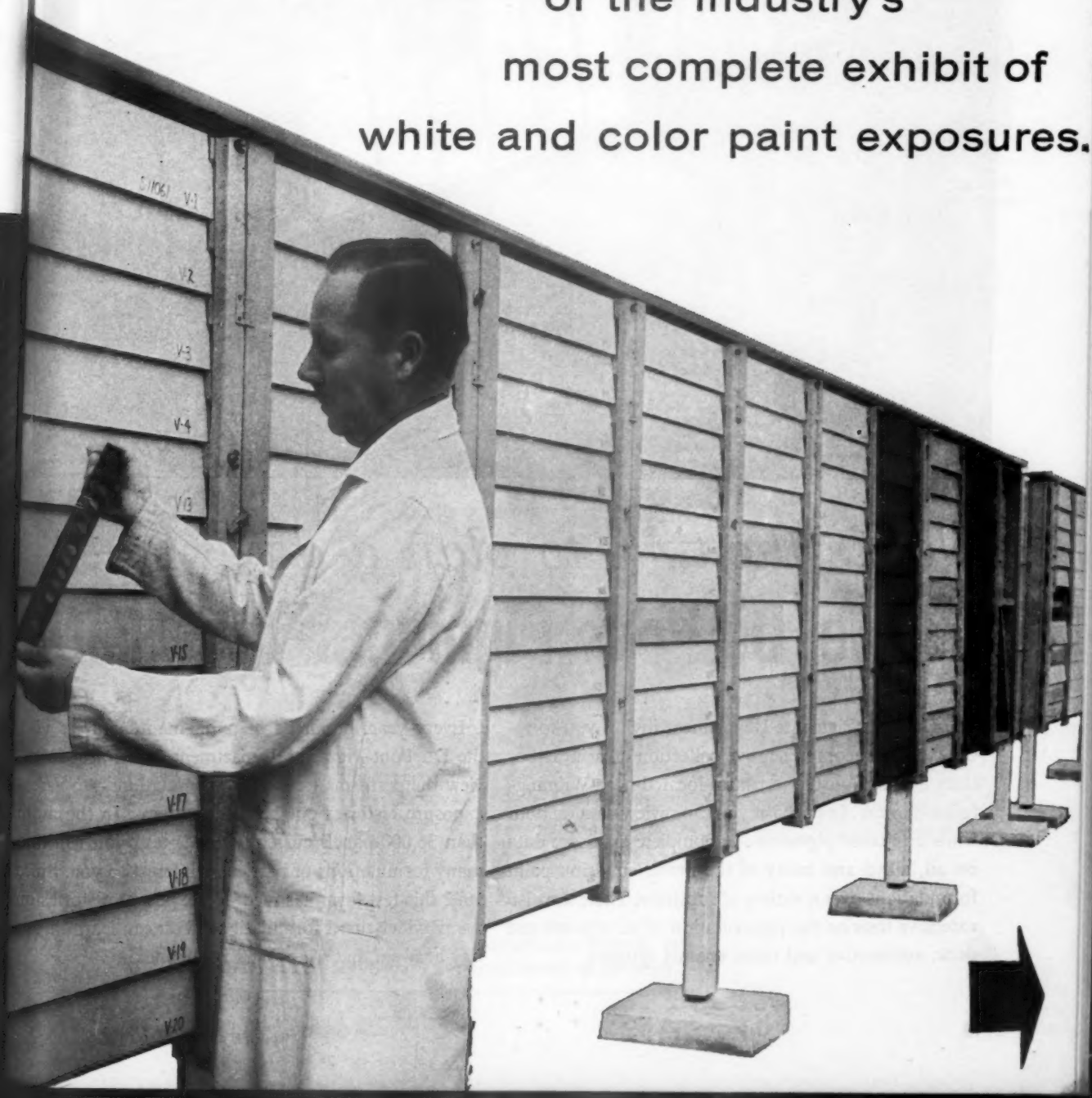
To help you choose the best solvent, coupler, plasticizer or diluent for your requirements, we've prepared a six-page booklet, the "Solvent Selector." Ask for a copy from your Technical Representative or write Union Carbide Chemicals Company, Division of Union Carbide Corporation, Room 328, Dept. H, 30 East 42nd Street, New York 17, N. Y.

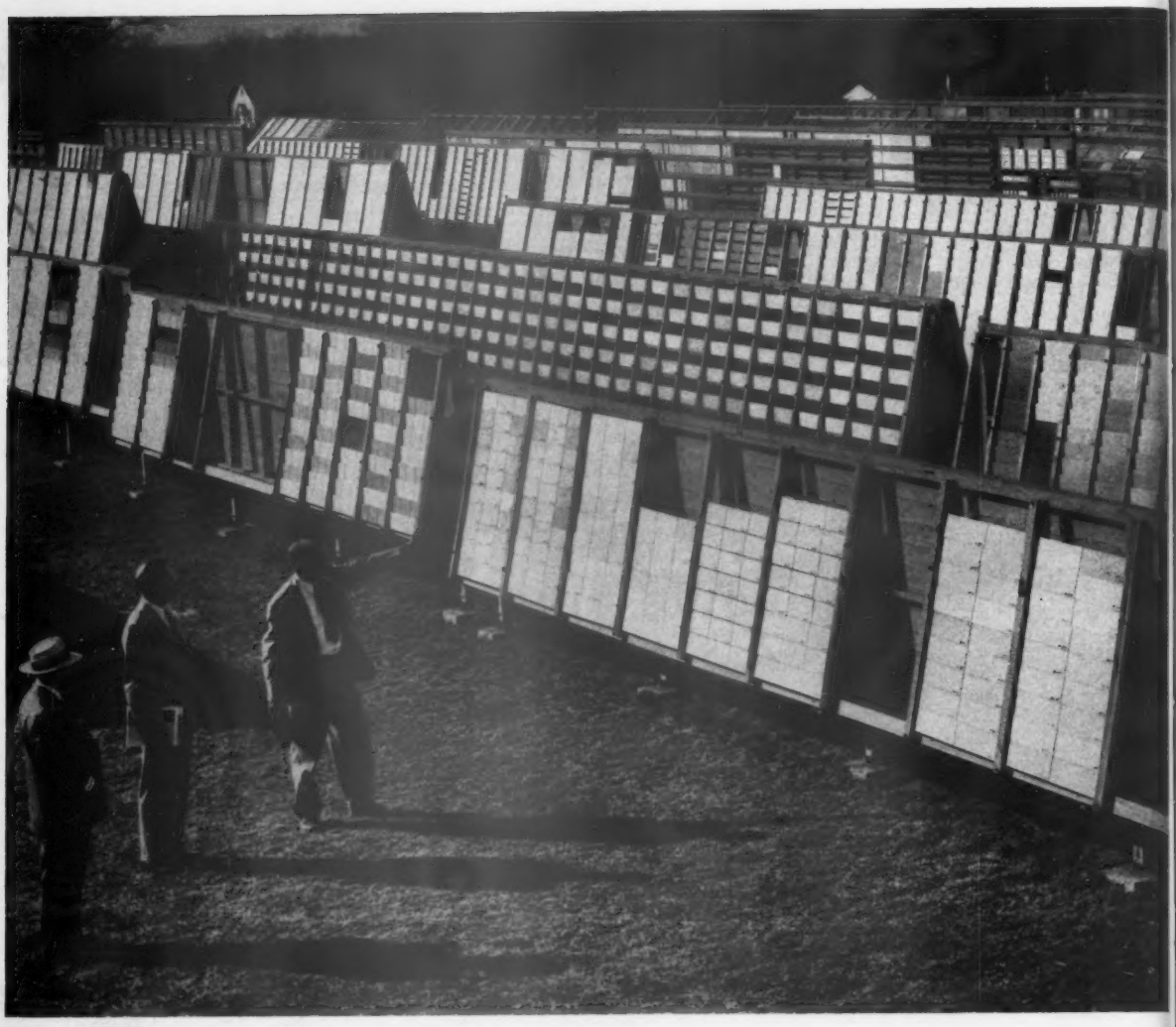
UNION CARBIDE CHEMICALS

"Carbitol", "Cellosolve" and "Union Carbide" are trade marks of UCC.

Planning new paint formulations?

Then you can profit
from the test results
of the industry's
most complete exhibit of
white and color paint exposures.





Now's the time to plan a day
at the Du Pont Pigments Test Farm

The Du Pont Pigments Department invites you to review the most comprehensive collection of paint exposures available at the test farm located near Wilmington, Delaware. In one visit you can review data on both white and color pigments . . . complete exposure data on oil, alkyd and many of the newer emulsion paint formulations over a variety of substrate. There are also extensive tests on the pigmentation of trim, porch and deck, automotive and other enamel systems.

Every year, hundreds of paint manufacturers visit the Du Pont Pigments Department Test Farm to review the performance of new formulations—to assess exposure histories on the older systems. In the more than 36,000 panels currently under test, you will find many formulations of particular interest to you. Since 1932 this test farm has recorded exposure histories on many widely used formulations. You can learn in one day answers that were years in the making.

For example . . .

You will be able to compare the "washing" characteristics of several paint formulations when used on wood-above-masonry construction.

You will also find many formulations containing pigment colors. Here, the group is discussing the properties of various colored exterior paints.

In our conference room, you will have the opportunity of reviewing the results of your trip or to examine in greater detail items of specific interest at the test farm.

84 actual house tests play an important part in our exposure program. Here you can inspect in-use performance of a variety of formulations, which supplement exposure histories from the test farm.

A SIMILAR TEST FARM AT EL MONTE, CALIFORNIA, IS OPERATED TO SERVE PAINT MANUFACTURERS IN THE WEST.

YOUR TOUR of the Test Farm is easily arranged.
SIMPLY CALL your Du Pont Pigments representative...at one of the offices listed below. He'll be glad to arrange your visit.

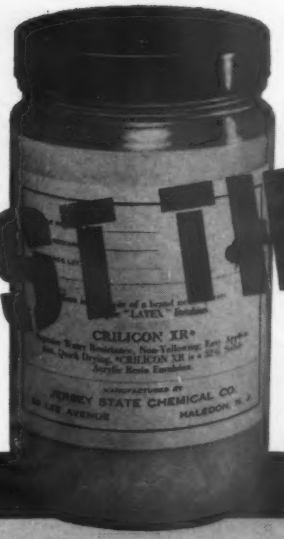
Reach him at:

ATLANTA 2, GA.....225 Moore St., S.E.....Jackson 5-5178
BOSTON (Malden 48), MASS....359 Washington St....DAvenport 2-8080
CHICAGO 6, ILL.....20 North Wacker Drive.....ANdover 3-7000
CLEVELAND 20, OHIO.....11900 Shaker Blvd.....Longacre 1-1060
DETROIT 35, MICH....13000 West Seven Mile Rd.....UNiversity 4-1963
HOUSTON 25, TEX.....1105 Prudential Bldg.....Jackson 3-5533
NEW YORK 1, N. Y.....1027 Empire State Bldg.....LOngacre 3-6400
PASADENA, CALIF.....325 N. Lake Ave.....RYan 1-7431
PHILADELPHIA 3, PA.....117 South 17th St.....RIttenhouse 6-2080
PORTLAND 9, OREGON.....1238 N. W. Glisan St.....Capitol 2-6012
SAN FRANCISCO 4, CALIF.....111 Sutter St.....EXbrook 2-6230
WILMINGTON 98, DEL.....1007 Market St.....PRospect 4-1000

Pigments Department
E. I. du Pont de Nemours & Co. (Inc.)

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



TEST THIS SAMPLE OF crilicon X-R

Against Whatever Emulsions You Use

USE THIS CHECK LIST

Check Your Present Emulsion	Property or Characteristic	Check crilicon X-R	Advantage for You or for Your Customer
	Extreme water resistance	YES	Forms a film that is not just washable . . . but scrubbable!
	High solids content	VERY HIGH, 52% SOLIDS	Simplifies formulation procedures.
	High pigment binding	YES	Allows high PVC while retaining maximum scrubbability.
	Excellent mechanical stability	YES	Will not settle, stratify, or cream on prolonged standing — safe for bulk storage.
	Freedom from odor	PRACTICALLY NO ODOR	Produces a highly desirable "Odorless Paint" — widest possible applications.
	Forms a water-clear, high-gloss film	YES	Suitable as a fast-drying, clear primer-sealer or finish coat.
	Film is tough and elastic	YES	Finish coat is scuff-proof, resists cracking and peeling.
	Grease-proof, chemically inert film—resists heat and ultra-violet light	YES	Excellent for exteriors and most industrial applications.

Crilicon X-R, Jersey State's *improved* acrylic emulsion, puts more profit in your paint manufacture in three ways . . .

1. Enables you to produce a superior water base paint without increasing your production costs.

2. In many instances, simplifies formulation procedures and eliminates storage problems.

3. Stimulates retail sales with the "Dealer's Choice" program . . . a unique point-of-purchase merchandising program ready-made for your brand name.

SEND FOR SAMPLES AND SPECIFICATIONS TODAY!

JERSEY STATE CHEMICAL COMPANY

"Chemists for Industry Since 1937"

59 Lee Avenue • Haledon, New Jersey

Dept. PV-8

West Coast Representative

Chemical Manufacturing Co., Inc. of California

714 West Olympic Boulevard, Los Angeles 15, Cal.

Please tell me about your "Dealer's Choice" program and send me ☐ Technical Information ☐ Samples of Crilicon X-R for the applications checked.

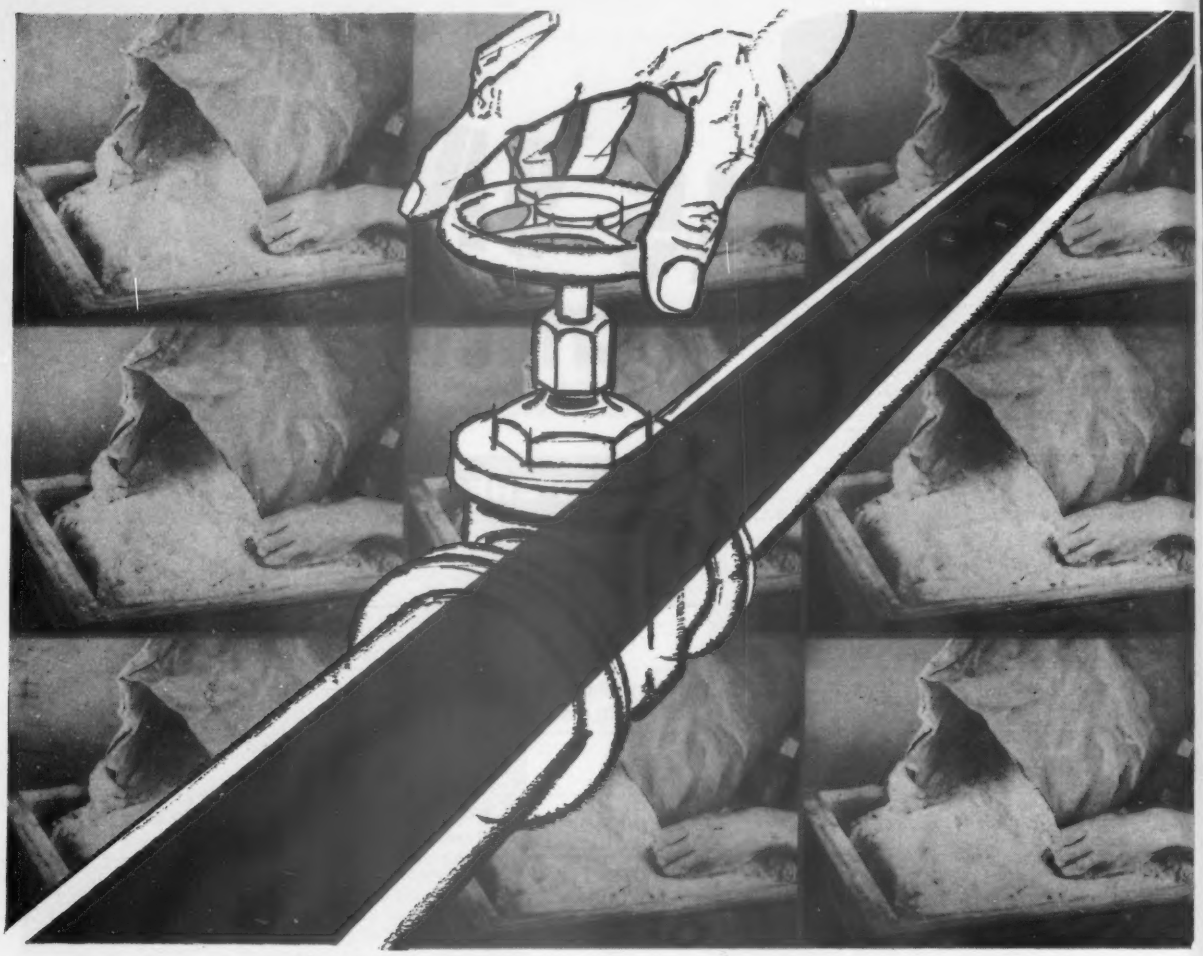
NAME _____

TITLE _____

FIRM _____

ADDRESS _____

APPLICATIONS	LOW COST	MEDIUM COST	HIGH COST
INTERIOR FLAT with casein			
INTERIOR FLAT without casein			
EXTERIOR PAINT			
PRIMER-SEALER			
WATER-CLEAR FINISH			
COMBINATION INTERIOR-EXTERIOR			



A liquid simplifies handling

Glycerine is a liquid. In making alkyds, there are no bags to lift, no fines. As easily as opening a valve, Glycerine can be piped into your kettles. Too, you can measure it either by volume or weight. And as needed, it's easy and safe to add more Glycerine during cooking.

Glycerine has other important advantages in making alkyds:

- **Its simple molecular structure makes cooking easier.**
- **Its favorable combining weight makes a wide range of resin properties economically feasible.**
- **Its chemistry has been thoroughly evaluated. Methods are perfected and literature abundant.**

Glycerine's usefulness continues to grow. Stable in price, dependable in supply, Glycerine offers a unique balance of properties. We'd like to send you our 20-page booklet: "Glycerine Terms, Tests and Technical Data." Address your request to the Glycerine Producers' Association.

Properties

HYGROSCOPICITY • STABILITY

SOLVENT POWER • VISCOSITY

NONVOLATILITY • NONTOXICITY

TASTE • COMBINING WEIGHT

Applications

HUMECTANT • CARRIER

SOLVENT • LUBRICANT

SOFTENER • EMOLLIENT

ANTI-FREEZE • ALKYD BASE

GLYCERINE PRODUCERS' ASSOCIATION • 295 MADISON AVENUE, NEW YORK 17, N. Y.

Here's more proof!

With an Isophthalic resin, W.P. FULLER & CO. says,

"spectacular new house paint

ADDS AT LEAST 2 EXTRA YEARS OF PAINT BEAUTY TO YOUR HOME"

Employing an Isophthalic based resin, W. P. Fuller & Co. has developed an exterior wood house paint with increased gloss and color retention. They claim it gives a home a fresh new-painted look for two years longer than the finest oil-type paint available. Spreads faster. Easier to apply. Dries hours sooner. Costs no more.

This new W. P. Fuller paint represents another application of an alkyd resin made from Oronite® Isophthalic. Oronite's extensive testing on Isophthalic based exterior and interior paints and enamels, baking finishes and industrial finishes will prove to you the superior products possible with this new raw material.

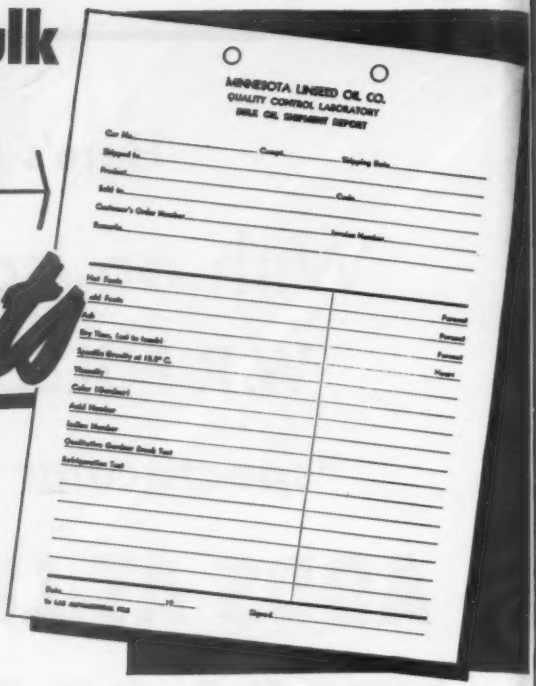
Just contact the Oronite office nearest you for full information on Isophthalic based surface coatings.

ORONITE CHEMICAL COMPANY
A CALIFORNIA CHEMICAL COMPANY SUBSIDIARY
EXECUTIVE OFFICES • 200 Bush Street, San Francisco 20, California
SALES OFFICES • New York, Boston, Wilmington, Chicago, Cincinnati, Cleveland, Houston, Tulsa, Los Angeles, San Francisco, Seattle
Foreign Affiliate: California Chemical International, Inc., San Francisco, Geneva, Panama

4924

Minnesota Linseed's Bulk Oil Shipment Report

gives the facts when you buy!


MINNESOTA LINSEED OIL CO.
QUALITY CONTROL LABORATORY
BULK OIL SHIPMENT REPORT

A Bulk Oil Shipment Report is mailed to customers when linseed oil shipments leave the plant.

HOT FOOTS, cold foots, acid and iodine numbers, viscosity, color—customers get all the facts on every bulk shipment of pure Minnesota Linseed Oil at the time it leaves the plant.

Knowing the chemical properties of linseed oil is vital in blending good finishing materials. That's why major paint and varnish manufacturers have depended on Minnesota Linseed Oil since 1870 as a superior base for paints and varnishes—a base extracted from top grade flax in the most modern plant of its kind. All linseed oil production is *quality controlled* and supervised by technicians who know their business!

Minnesota Linseed customers can count on uniformity time after time, because every bulk shipment is analyzed and tested—with a written report in the hands of buyer before the car arrives.

REPRESENTATIVES

BOSTON, MASS.
The Truesdale Co.
52 Cambridge St.

CHICAGO, ILL.
National Lead Co.
900 West 18th St.

CLEVELAND, OHIO
Norman G. Schabel Co.
20950 Center Ridge Road

DAYTON, OHIO
The Dayton Oil Co.
1201 East Monument Ave.

DETROIT, MICHIGAN
Baker & Collinson
12000 Mt. Elliott Ave.

LOS ANGELES, CALIF.
Stay & Day Paint Materials Co.
363 South Mission Road

FLOURTOWN, PA.
E. W. Kaufmann
P. O. Box 27

PITTSBURGH, PA.
Joseph A. Burns & Son
124 Harrison Ave.

SAN FRANCISCO, CALIF.
Wm. C. Loughlin Co.
311 California St

SEATTLE, WASH.
W. Ronald Benson, Inc
820 1st Ave. So.

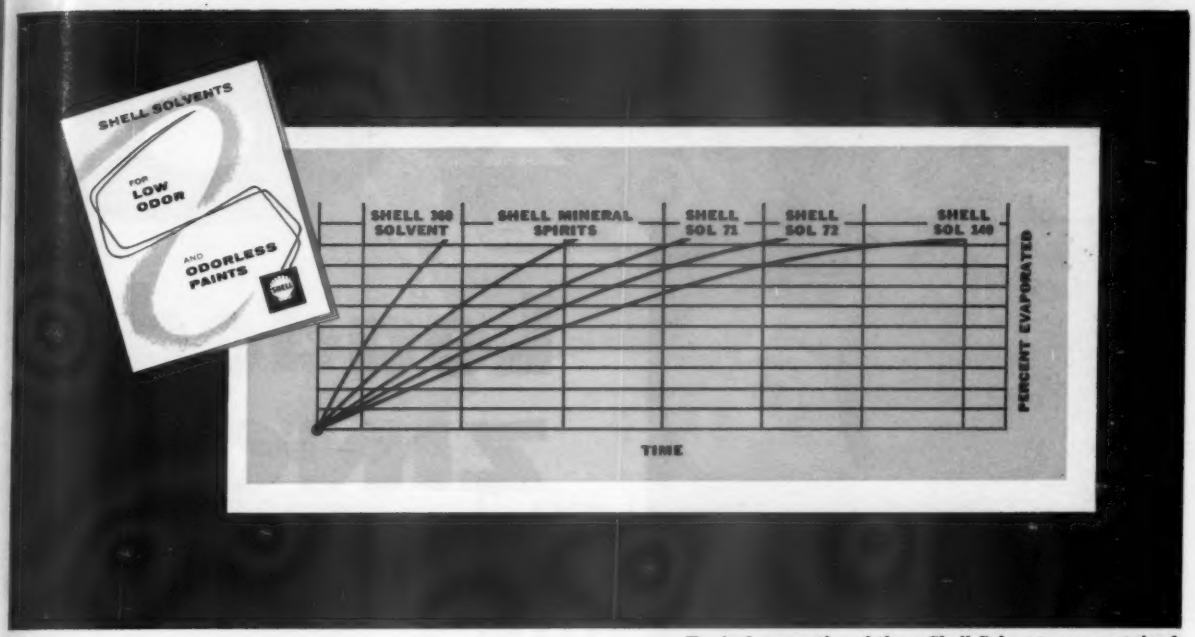
At Minnesota Linseed's Solvent Extraction Building, technicians utilize the newest processes known to the industry.

Minnesota
LINSEED OIL CO.

SPECIFY MINNESOTA IT'S PURE LINSEED OIL

MINNEAPOLIS 21, MINNESOTA • PHONE: SUnset 8-9011

SINCE 1870



Typical properties of these Shell Solvents are contained in booklet shown. It will be mailed on request.

Where odor is a problem use these

SHELL SOLVENTS

SHELL SOL 71 AND 72

. . . have no odor, are ideal for interior finishes, polishes and cleaners. Shell Sol 71 offers slightly faster evaporation.

SHELL SOL 360

. . . much faster evaporation than mineral spirits, low odor, over 100° F. flash point.

SHELL SOL 140

. . . a high-flash, slower drying solvent with unusually low odor.

SHELL MINERAL SPIRITS

. . . traditional distillation range, solvent power and drying. Mild odor.

These solvents are recommended for low odor and odorless products.

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK

100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

AZO Leaded ZINC OXIDES

meet exact requirements of paint industry

Paint manufacturers in increasing numbers are using economical leaded zinc oxides in their exterior paints. To meet this growing demand, a number of AZO leaded zinc oxides have been developed, and are immediately available.

In addition, we are prepared to produce oxides of any lead content and consistency to meet the requirements of special formulas. You can be sure of the right leaded zinc oxide for your product when you specify AZO.

CO-FUMED TYPE LEADED ZINC OXIDES

AZO 35-L. 35% leaded zinc oxide of low consistency.

AZO 50-L. 50% leaded zinc, low consistency.

AZO 18-L. Highly basic, low consistency type.

All co-fumed leaded zinc oxides are easily mixed and incorporated in paint vehicles.

BLENDED TYPE LEADED ZINC OXIDES

AZO 20-B. Acicular type of 20% leaded zinc oxide. Excellent color, medium consistency.

AZO 35-M. Acicular type of 35% leaded zinc oxide. Excellent color, medium consistency.

Blended type leaded zinc oxides generally give higher consistency (or oil absorption) and improve the color of the product.

American Zinc sales company

Distributors for AMERICAN ZINC, LEAD & SMELTING COMPANY
COLUMBUS, OHIO • CHICAGO • ST. LOUIS • NEW YORK

Check the 14-member UFORMITE line!

Rohm & Haas makes 14 different nitrogenous coating resins to provide the specific properties necessary in the formulation of high quality, special-purpose industrial finishes. These UFORMITE resins are water-white, possess a high degree of color retention and provide hardness and quick-curing properties in baking enamels.

The 14 UFORMITE resins of urea, melamine and triazine formaldehyde types differ in their rate of curing and hardening, and the amount of gloss they contribute. They are compatible with a wide range of alkyd resins and solvents.

We will be pleased to send you full information about our 14-member UFORMITE line. This wide selection of UFORMITE grades offers many approaches to the solution of your coating problems.

Chemicals for Industry

ROHM & HAAS COMPANY

THE RESINOUS PRODUCTS DIVISION

Washington Square, Philadelphia 5, Pa.

Representatives in principal foreign countries

UFORMITE *is a trademark, Reg. U.S. Pat. Off. and in principal foreign countries.*

UFORMITE

Cost-conscious paint and resin makers buy their coal chemicals* from Pittsburgh Coke! Know why?

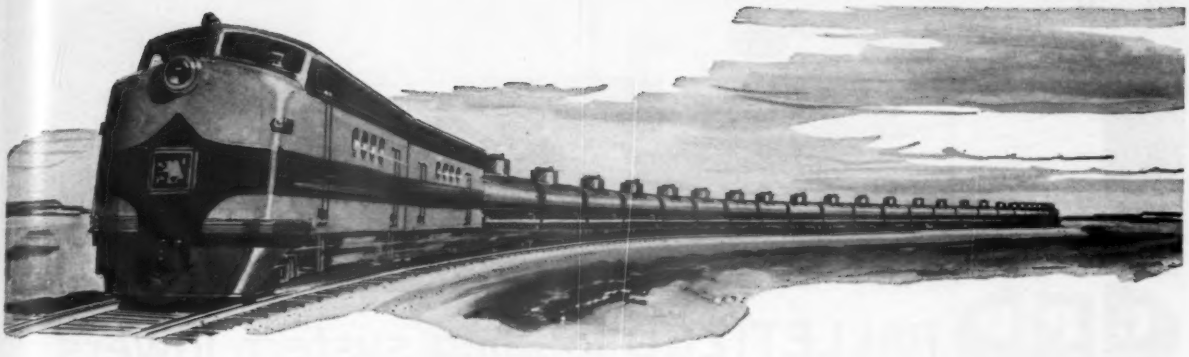
Certainly!
Split car shipments earn carload prices. One order reduces paper work and follow-up. And no one offers better technical service than Pittsburgh Coke!

* Phthalic Anhydride
Maleic Anhydride
Fumaric Acid
Decyl Butyl Phthalate
Phthalocyanines
(write for spec sheets!)

PITTSBURGH
COKE & CHEMICAL CO.

WBW-7244

COAL CHEMICALS • PLASTICIZERS • PROTECTIVE COATINGS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON



Dependable Service!
Fast Delivery!

HIGH QUALITY SOLTROL* 130

ODORLESS MINERAL SPIRITS

DEPENDABLE SUPPLY! You can be sure of on-time deliveries when you deal with Phillips. Full scale production and prompt shipment of your order assure you a reliable supply at all times.

CONSISTENT UNIFORMITY! Phillips Soltrols assure uniform results. Every precaution is taken to protect the excellent physical properties necessary to assure you of uniformly good results at all times.

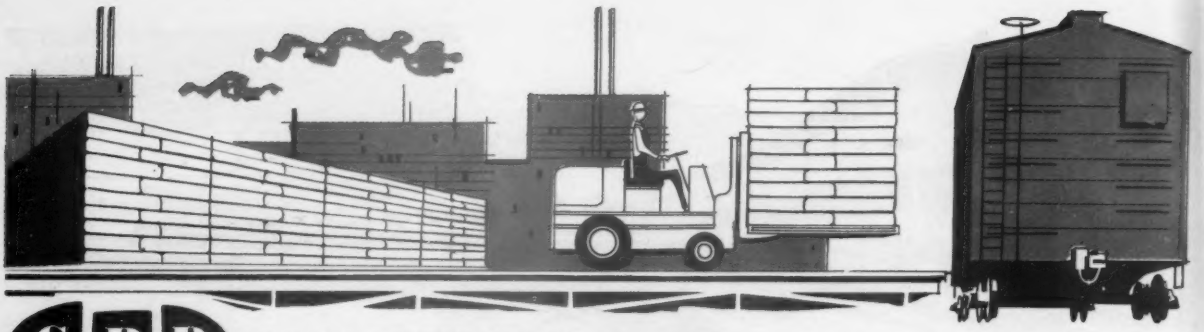
CONTROLLABLE DRYING TIME! Use Soltrol 130 for conventional drying characteristics, Soltrol 170 for longer wet edge . . . or a combination of the two. Compartment cars containing both Soltrols are available.

FREE SAMPLES! We want you to test the Soltrols and see for yourself how they perform in your product. Send for your free samples today.

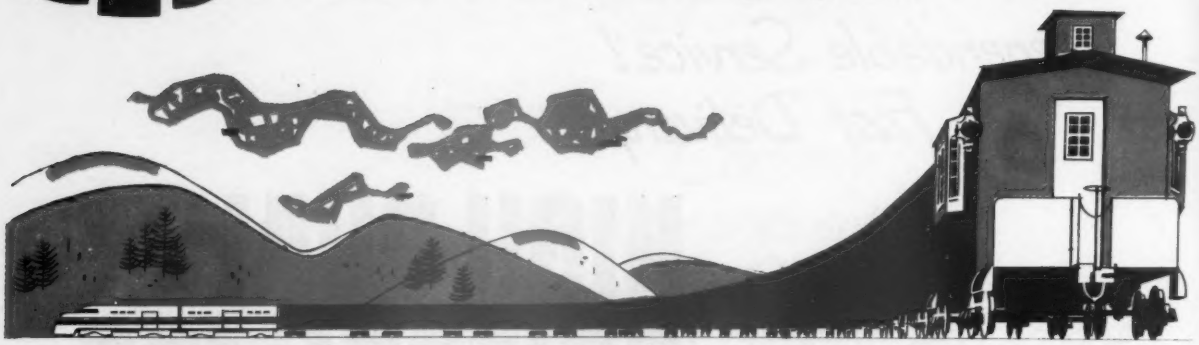
*A Trademark.

Also available in split cars

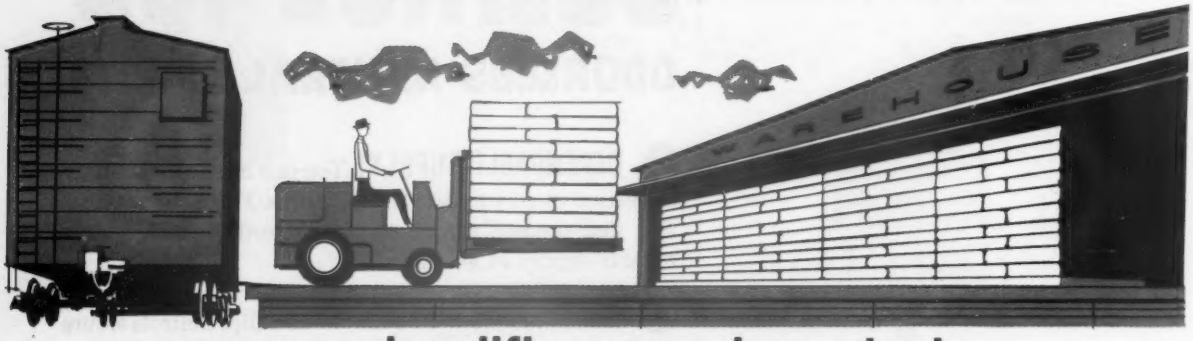
PHILLIPS PETROLEUM COMPANY • Special Products Division
Bartlesville, Oklahoma Bartlesville 6600



PALLETIZED loading system lowers



your handling costs, takes less warehouse



space, simplifies your inventories

Take advantage of CPD's palletized shipments by rail or by truck, another of the extra services offered by the world's largest producer of marble and limestone. Our standard wet and dry ground calcium carbonate can be shipped in mixed carloads, including the new Wingdale White now being produced by our Wingdale, New York, plant. For a free brochure describing the cost-cutting, time-saving palletized loading systems, write us at Tate or ask any of our representatives.

GAMACO / GAMAKAL / CALWHITE / KALMAC / 5-25
#10 WHITE / WINGDALE WHITE

CALCIUM PRODUCTS DIVISION
THE GEORGIA MARBLE COMPANY, TATE, GEORGIA

VELSICOL W-617

Hydrocarbon Resin Emulsion

helps more people use emulsion paint more often!

NEW! W-617 EXPANDS YOUR SALES POTENTIAL!

Women like to redecorate. But they don't like to compromise with quality. And there's always the budget to consider. With Velsicol W-617, you can remove the quality and budget limitations on your market, and sell more emulsion paints. W-617 maintains high standards of scrubbability, flexibility, and freeze-thaw, but cuts raw materials costs way down!

NEW! W-617 MEANS BIG RAW MATERIALS ECONOMIES!

W-617 is a low cost water dispersed film former. W-617's low cost makes it ideal for use as the sole film former in the production of white and pastel shade flat paints. Used with styrene butadiene or acrylic latices, it maintains quality while drastically reducing cost. Used in place of alkyd resins, as a modifying agent, it provides greater scrub resistance at lower cost. Raw materials savings become overall production savings, too, because W-617 is versatile and easy to use in emulsion paint formulations.

NOW AVAILABLE IN COMMERCIAL QUANTITIES! FOR TECHNICAL INFORMATION AND TEST SAMPLES, MAIL THIS COUPON TODAY!

LOOK FOR THIS MAN

. . . your Velsicol representative, who can help you make better products for less!

VELSICOL
CHEMICAL CORPORATION
330 E. GRAND AVE., CHICAGO 11, ILL.

International Representative: Velsicol International Corporation, C.A. • P. O. Box 1687 • Nassau, Bahamas, B.W.I.

MAIL THIS COUPON TODAY!

VELSICOL CHEMICAL CORPORATION
330 East Grand Avenue, Chicago 11, Illinois

- ☐ Please send a sample of W-617 for pilot plant use.
- ☐ Please have a salesman call.
- ☐ Please send technical literature.

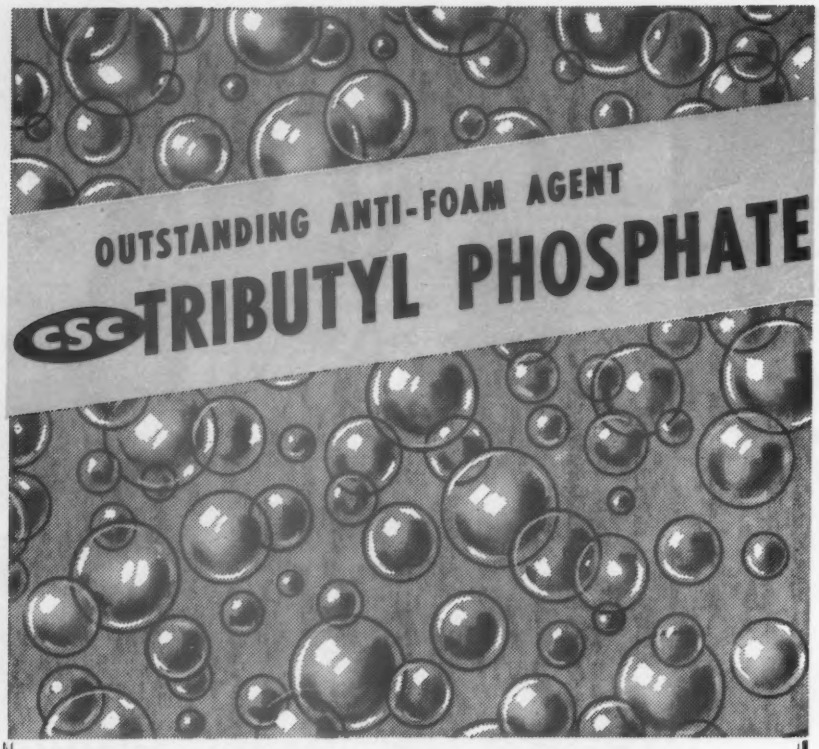
PVP88

Name_____

Company_____

Address_____

City_____ Zone____ State_____



FOR SYNTHETIC LATEX PAINTS—as little as 1% Tributyl Phosphate reduces foam during manufacture, can-filling and application.

OTHER FOAM APPLICATIONS—Preferred for paper coatings, water adhesives, casein solutions, inks, textile sizings and detergent solutions. Tributyl Phosphate offers exceptional cost-efficiency value and minimal residual odor.

Colorless and odorless, CSC Tributyl Phosphate is miscible with most common organic solvents and is an excellent selective solvent for a great variety of materials.

CSC CHEMICALS FOR INDUSTRY

ALCOHOLS
Methanol Butanol
Ethyl Alcohol

AMINES AND AMMONIA
Ammonia, Anhydrous and Aqua
Ammonium Nitrate, Solid and 83% Sol.
Methylamines
Benzyltrimethylammonium Chloride
Hydroxyethyltrimethylammonium-bicarbonate

ESTERS
Amyl Acetate Butyl Acetate
Butyl Lactate Butyl Stearate
Dibutyl Phthalate Ethyl Acetate
Tributyl Phosphate

NITROPARAFFINS
Nitroethane 2-Nitropropane
Nitromethane 1-Nitropropane
Alkaterges Diamines
Aminohydroxy Compounds
Nitrohydroxy Compounds
Chloronitroparaffins

PHARMACEUTICALS, BULK
Bacitracin Cycloserine
Riboflavin, U.S.P. and U.S.P., R.S.

OTHER CHEMICALS
Acetone Formaldehyde
Pentaerythritol

COMMERCIAL SOLVENTS
CORPORATION
260 Madison Avenue, New York 16, New York

ATLANTA, GA. • BOSTON, MASS. • CHICAGO, ILL. • CINCINNATI, OHIO • CLEVELAND, OHIO DETROIT, MICH. • HOUSTON, TEXAS • INDIANAPOLIS, IND. • KANSAS CITY, MO. • LOS ANGELES, CALIF. • LOUISVILLE, KY. • MEMPHIS, TENN. • MILWAUKEE, WISC. • MINNEAPOLIS, MINN. NEWARK, N. J. • NEW ORLEANS, LA. • PHILADELPHIA, PA. • PITTSBURGH, PA. • PORTLAND, ORE. ST. LOUIS, MO. • ST. PAUL, MINN. • SAN FRANCISCO, CALIF. • STERLINGTON, LA. • IN MEXICO: COMSOLMEX, S.A., MEXICO 7, D.F. • IN CANADA: McARTHUR CHEMICAL CO., MONTREAL, QUE.

REDUCE YOUR GRINDING TIME WITH

Kentucky's

NEW SOFTEX CHROME GREENS

To reduce your C.P. grinding time, we recommend Kentucky's new Softex Chrome Greens. They provide exceptionally good resistance to darkening on exposure. The shades are bright—the strength good. If you want proof, request samples now.

SOFTEX CHROME GREENS

No. 8904 CP Green, Ex. Lt.
No. 8915 CP Green, Med. Lt.
No. 8930 CP Green, Med.
No. 8946 CP Green, Dk.

Write Technical Service Dept.
For Complete Information

Kentucky Color
AND CHEMICAL COMPANY, INC.
Louisville 12, Kentucky

"U. S." UNITIZED JAR MILLS

Dependable : Low Cost
Easy to Operate

"SELF-CENTERING"* ROLLS

keep containers centered on mill, reduce friction noise, jar wear and breakage. Jars can't creep and fall off.

EASILY ADJUSTED ROLLS

can be quickly positioned to handle jars from 2½" to 13" in diameter, up to 12" long.

SMOOTH-RUNNING OILITE BEARINGS

assure quiet operation and long, trouble-free performance.

STURDY WELDED STEEL FRAME

built for rigorous continuous service. Fully portable, yet heavy enough to stay put.

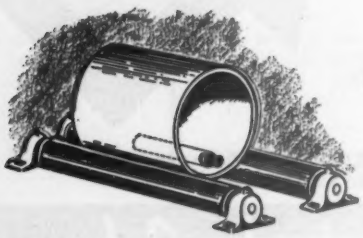
LONG-WEARING ROLLS

made of special Neoprene rubber permanently molded on solid steel core. Resistant to oils, chemicals and solvents.

WIDE RANGE OF STANDARD SIZES

"U. S." offers a wide choice of capacities to meet every laboratory or specialized production requirement. Either constant or variable speed drives are available, as well as other optional features such as tachometers, automatic timers, etc., for utmost adaptability.

*Patented



HANDY HINTS ON JAR MILLING

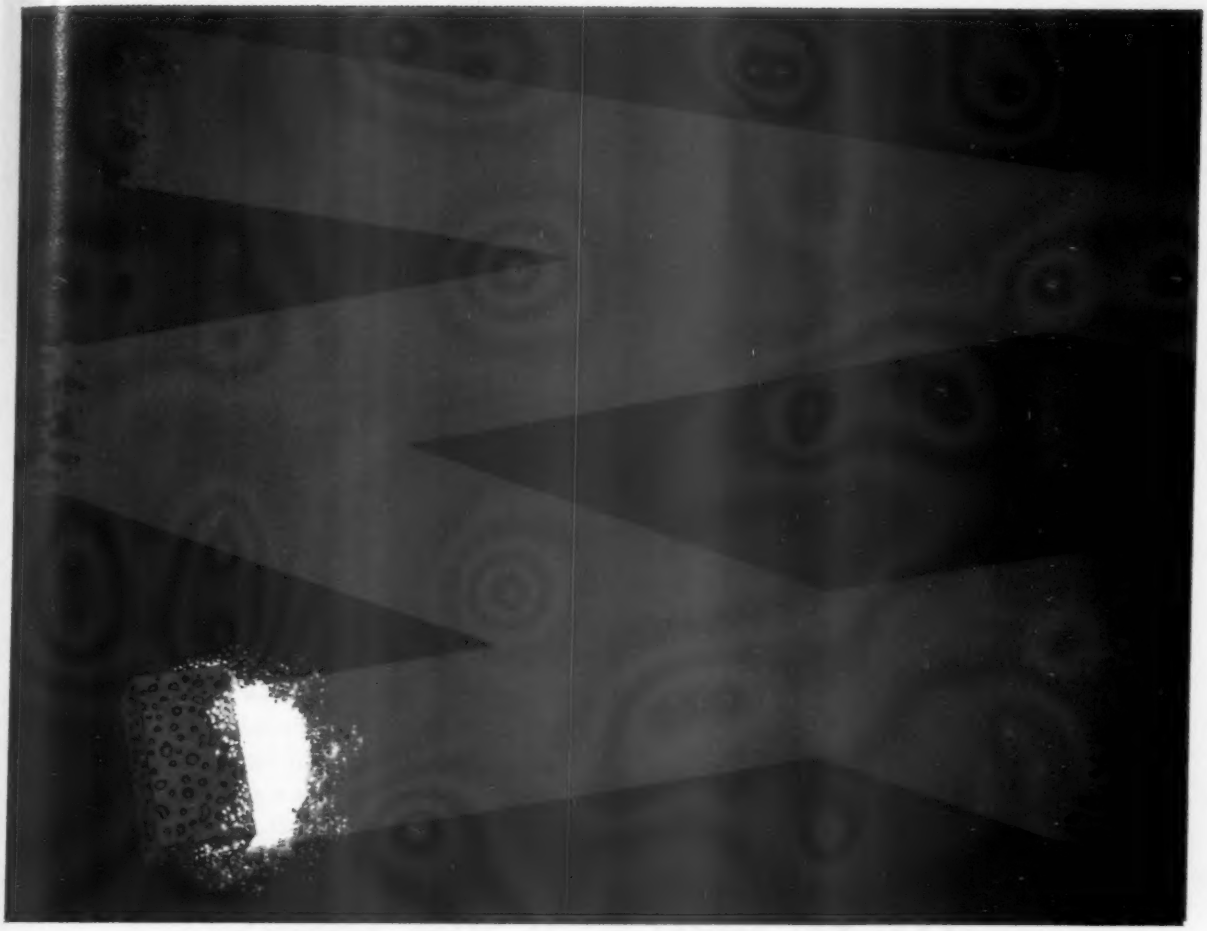
Extremely small containers, such as test tubes or small paint cans, can easily be rolled on your jar mills by placing them inside a piece of pipe or larger round container.

For additional helpful grinding and mixing data plus complete specifications on "U. S." Jar Mills
WRITE FOR BULLETIN 280.

PROCESS EQUIPMENT DIVISION

U. S. STONEWARE
AKRON 9, OHIO

104-F



here's why Gelva PVAc emulsions offer more for your money

you can sell the superior scrubability of Gelva based paints

The free filming characteristic of GELVA TS-30 emulsion and its optimum particle size distribution contribute significantly to the outstanding scrubability of GELVA based paints. This is an important advantage which you can sell to your customers. GELVA TS-30 also has superior stability and an unexcelled balance of properties for a full line of coatings, interior and exterior paints and primer sealers.

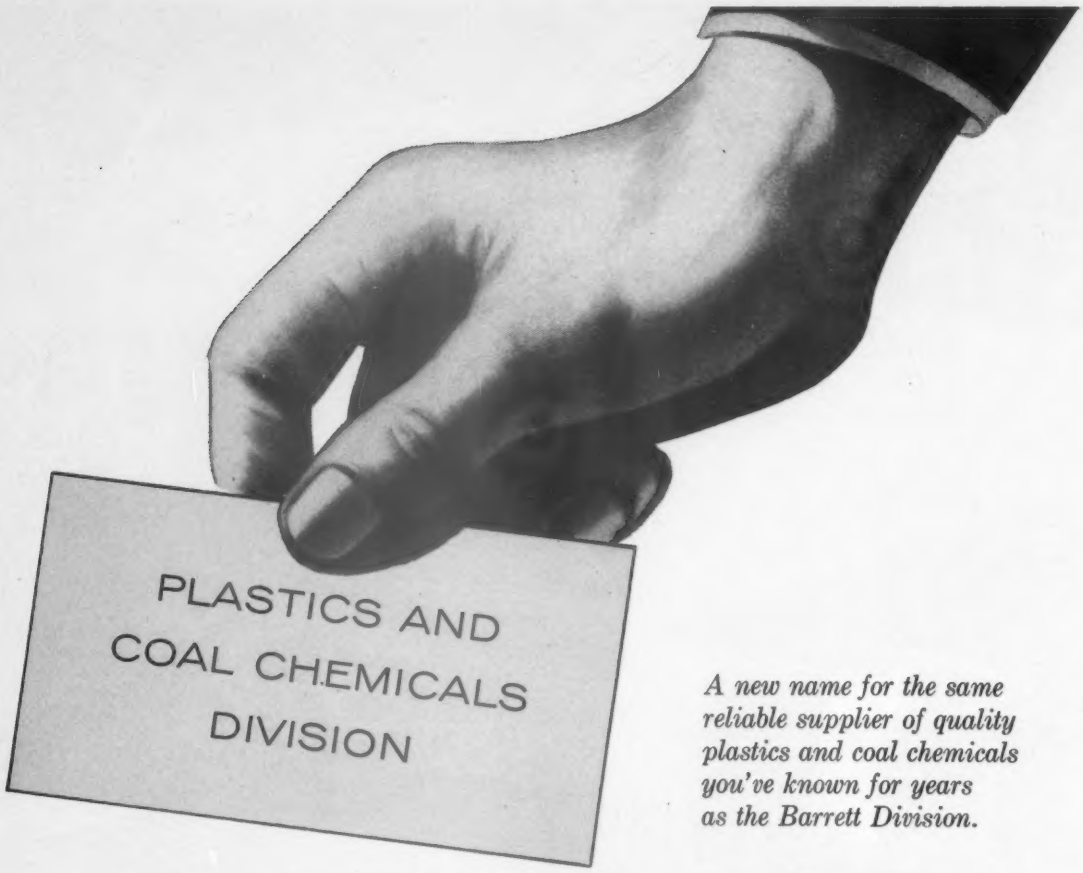
What's more, Shawinigan provides GELVA users with technical service in depth . . . technical service based on more than 10 years experience with commercially proved polyvinyl acetate paints. Shawinigan is ready to give you all the assistance you need to formulate and manufacture exactly the right polyvinyl acetate paint, homopolymer or copolymer, for your market. It will pay you to consult Shawinigan . . . we have the quality and the know-how. Write for our booklet, "GELVA Emulsions for Paint", to Shawinigan Resins Corporation, Department 2280, Springfield 1, Mass.

Success with PVAc paints requires a quality emulsion and expert technical service. You get both from Shawinigan.

SALES OFFICES: ATLANTA CHICAGO LOS ANGELES NEW YORK SAN FRANCISCO SPRINGFIELD

GELVA® *emulsions for paints*

SHAWINIGAN RESINS®



A new name for the same reliable supplier of quality plastics and coal chemicals you've known for years as the Barrett Division.

We've changed our name!

When you order from Plastics and Coal Chemicals Division, you'll be doing business with the same people who have served you in the past. You'll have the same technical assistance and research facilities at your service.

We have changed our name and organized our operations to concentrate solely on production, research and market development in coal-tar chemicals, industrial tar products, and plastics and resins. For everything you need in these fields, you'll find we can serve you better than ever.

Order now from Plastics and Coal Chemicals Division

Chemicals

Tar Acids
Tar Acid Oils
Phthalic Anhydride
Maleic Anhydride
Fumaric Acid
Phthalonitrile
Plasticizers
CUMAR® Resins
Resin S
Rubber Compounding Materials
"A-C" Polyethylene Lubricants
Naphthalene
Anthracene
Tar Bases
Niacin (Nicotinic Acid)
Acetone
Acetophenone
Alpha-Methylstyrene
Cumene
Glycols
Ethanolamines
Aromatic Industrial Solvents
Ethylbenzene
Flotation Agents
Pickling Inhibitors
Tar Distillates

Industrial Tar Products

Creosote Oils
Industrial Pitches
Industrial Coatings
Pipeline Enamels

PLASKON® Plastics & Resins

Urea, Melamine, Alkyd and Nylon Molding Compounds
Alkyd, Urea and Melamine Protective Coating Resins
Phenolic, Polyester and Urea Industrial Resins

PLASTICS AND COAL CHEMICALS DIVISION
Formerly part of the Barrett Division
Allied Chemical Corporation
40 Rector Street, New York 6, N. Y.

Allied Chemical

NEW TOOL FOR EVALUATING SAGGING OF PAINT

By
W. W. Reynolds
and
E. C. Larson*

SAGGING is a term which describes the tendency of a wet paint film to flow downward when applied to vertical surfaces and thereby becomes thicker in one area than another. It is most commonly manifested by the formation of curtains of paint much to the distress of the painter. Of course some flowout of the paint is desirable so that brush marks are not left in the film. Sagging is a rheological phenomenon but it occurs while the solvent is continually escaping from the paint film which changes the flow properties of the film with time. This part is frequently ignored by many investigators who study sagging strictly on a bulk rheological basis. Nevertheless, it is now well understood that sagging occurs under stresses at very low shear rates although there is some disagreement on the rates of shear involved.[1,2] The Los Angeles Paint and Varnish Production Club[2] showed that sagging occurs at shear rates approaching zero and developed an instrument for measuring viscosity under these conditions. Thus sagging has been characterized quite well from bulk viscometric studies. However, attempts to measure sagging under conditions of actual practice have been less satisfactory. Numerous investigators have developed techniques and devices for measuring sagging, but all of these tests are somewhat subjective and qualitative. What is needed is a device which will give a rapid, reproducible and quantitive rating of sagging. With such an instrument the study of sagging could be put on a rigorous basis where rheological and solvent release rate measurements could be related to a quantitative assessment of sagging under conditions of actual practice. Such a device has been developed and is the subject of this paper.

*W. W. Reynolds and E. C. Larson are connected with Shell Oil Co., Research Laboratory, Wood River, Ill.

Sag Index Blade

Sagging is a function of the viscosity of the paint film at low shear rate, film thickness, and the volatility of the solvent. Even the thinnest enamels will not sag if the film thickness is kept below some maximum value and conversely even very viscous enamels will sag if applied thicker than some minimum value. Therefore, measurement of sagging should be based on the assessment of the thickness of a paint film at which flow is excessive. In order for the measurement to be quantitative the film thickness must be accurately controlled and reproducible. What is necessary, then, is to cast a uniform film and sag line in one simple operation. This can be accomplished with the Sag Index Blade which we have developed. A photograph of it is shown in Figure 1. The blade is similar to a conventional film applicator but has seven ¼ inch notches in the doctoring edge so that seven uniform parallel stripes of paint may be applied simultaneously. The blade clearances at the notches

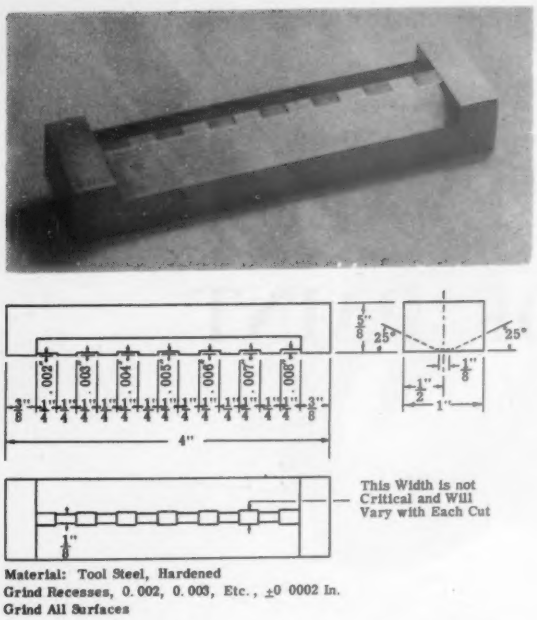
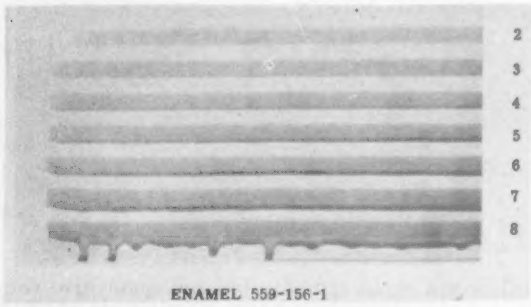


Figure 1. Sag index blade and its engineering diagram.



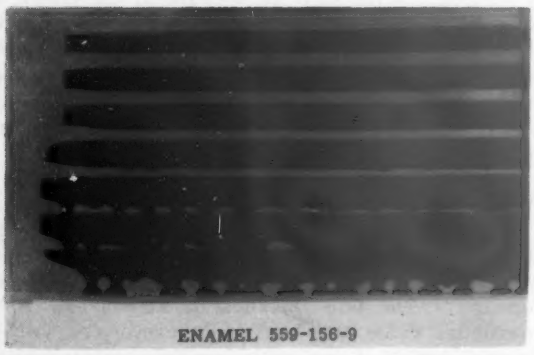


Figure 2. Examples of sagging with sag index blade.

vary in one mil increments from two to eight mils. The notches are ¼ inch apart. A second Sag Index Blade with clearances of 8, 10, 12, 14, 16, 18, and 20 mils has also been developed so that the rating scale may be extended to include paints which have minimum tendencies to sag. Films may be cast on glass or metal panels or on primed paper charts. As soon as the films are cast the panels are placed in a vertical position with the stripes running horizontally with respect to the resting edge of the panel and with the thickest stripes on the bottom. When the paint or enamel is dry or set the width of the stripes is measured to the nearest 1/16-inch. Sagging is expressed in terms of the blade clearance at which the width of the paint stripe exceeds 25% of its original value. These values are called the Sag Indices. The higher Sag Index values indicate better antisag properties. Paints that sag badly often exhibit tears which extend into the next thicker stripe. This is considered 100% sagging even though the stripe does not increase 100% in width throughout its entire length. Nonuniformity of the stripes at the "trailing" end of the panel must be disregarded.

Typical panels are illustrated in Figure 2. The top panel represents an odorless white gloss enamel which demonstrates reasonably good antisagging quality. There is 25% increase in width of the 6-mil stripe (Sag Index—6). "Curtains" appear only on the thickest film—8-mil clearance or approximately 4-mil wet film thickness. Brush-outs showed only trace sagging. The lower panel represents a red gloss enamel thinned with regular mineral spirits. This enamel sags badly (Sag Index—2). This poor antisag character was confirmed in brush-outs. As already mentioned it is desirable for a paint to flow a certain amount in order to have good leveling characteristics. Therefore, some sagging should occur when a relatively thick coat of paint is applied. In their work, the Los Angeles Club[2] concluded that a 2-millimeter sag of a 3-mil wet film in 30 minutes was quite acceptable. Since the stripe laid down at the 6-mil clearance of the Sag Index Blade represents approximately a 3-mil wet film, on the basis of the Los Angeles Club's work it would appear that 25% sagging of the 6-mil stripe is desirable.

Examination of Proprietary Enamels

A wide variety of proprietary or "trade sales" enamels were examined for sagging. Proprietary enamels were selected since they should represent a reliable range of acceptability which could be used to interpret Sag Index values. Properties of the enamels are shown in Table 1 along with Sag Index values and ratings assigned to brush-outs of the same samples. The brush-outs were made on primed wallboard using a 2-inch bristle brush. An arbitrary scale ranging from 0 to 10 was selected to rate sagging on the brush-out panels. A value of zero indicates extensive or uncontrollable sagging whereas a value of ten indicates the complete absence of sagging. The intermediate values simply represent the best estimates of sagging quality between the two extremes. Reference to Figure 3 shows that the values obtained with the Sag Index Blade correlate quite well with the brush-out ratings. Sample 5 appears to be an exceptional case. While it had a relatively high Sag Index value, it showed relatively poor sagging characteristics. One explanation for this behavior may be that the vehicle is highly thixotropic. If so, the high shearing rates involved in brushing would destroy

Sample Number	Type[a]	Total Solids, %w	Pounds Per Gallon	Stormer Vis, Krebs Units	Sag Rating	
					Sag Index[b]	Brush-Out Rating[c]
1	O-W-G	64.5	9.89	74	8, 6, 3	8
2	O-W-SG	70.0	10.92	83	>20, 16, 12	10
3	O-W-G	50.2	8.80	76	>8, >8, 7	7
4	O-W-SG	72.7	12.08	61	>8, 7, 6	10
5	M-R-G	48.4	7.83	90	>20, 18, 16	6
6	M-R-SG	60.9	9.85	76	>8, 7, 6	6
7	M-R-G	56.8	7.95	72	>8, 7, 6	8
8	M-R-G	51.8	7.72	85	18, 16, 12	9
9	O-R-G	54.3	7.83	60	6, 4, 2	2
10	M-R-G	56.6	7.78	62	7, 4, 3	3
11	M-W-SG	69.5	11.12	84	12, 10, 8	9
12	M-W-G	68.3	10.30	80	8, 7, 4	5
13	M-W-G	74.1	11.10	72	8, 6, 3	8
14	M-W-G	63.3	9.75	79	12, 10, 8	8
15	M-W-G	66.4	9.97	68	6, 4, 2	2
16	O-W-F	64.9	10.30	63	>8, 7, 5	5
17	O-C-F	72.4	12.20	75	>20,>20, 18	10
18	M-W-G	69.8	10.10	72	>8, 8, 6	8
19	M-R-G	46.1	7.60	65	7, 6, 5	5
20	M-W-G	66.8	10.30	84	>8, >8, 7	10
21	M-R-G	49.2	7.5	61	8, 7, 5	8

a. O = odorless mineral spirits; M = regular mineral spirits; G = gloss; SG = semigloss; F = flat; R = red; W = white; C = coral.
b. Blade clearance in mils at which sagging equals 100%, 50% and 25%.
c. Subjective rating based on a scale extending from zero (very poor) to ten (excellent or no sagging).

Table 1. Properties of Proprietary Enamels.

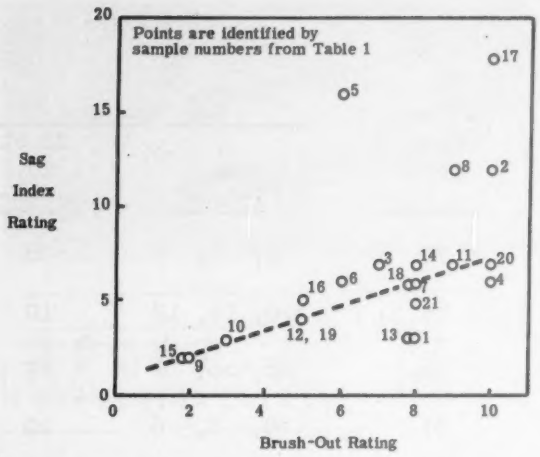


Figure 3. Sagging tendency of proprietary enamels: Sag index rating based on 25 per cent sag versus ratings based on brush-outs.

the gel structure momentarily and allow sagging, whereas the low shear rate produced with the Sag Index Blade might not be sufficient to destroy the structure. As a result the enamel sagged very little (Sag Index = 16).

Repeatability of the sag index measurement is excellent; essentially identical values are obtained on both glass and primed paper panels. Another important feature is that such data are reproducible by both novice and experienced testers.

Measurement of Hiding Power

The Sag Index Blade may also be used to measure hiding power which is a measure of a film's capacity or ability to cover solidly over another color in order to obscure or prevent the other color from showing through. Hiding power can be expressed as the volume of paint divided by the minimum thickness of film which gives 100% hiding or

$$HP = \frac{\text{volume of liquid}}{\text{min thickness of film for 100\% hiding}} \quad (1)$$

When the coverage is expressed in terms of square feet per gallon, equation (1) becomes

$$HP = \frac{231 \times 1000}{t \times 144} \quad (2)$$

where 231 is the number of cubic inches per gallon and t is the wet film thickness in mils.

$$t = B\,f \quad (3)$$

B is the applicator clearance in mils and f is a "shrinkage" factor.

$$HP = \frac{1604}{B\,f} \quad (4)$$

In most cases the "shrinkage" amounts to about 0.5 so the final equation becomes

$$HP = \frac{3208}{B} \quad (5)$$

In the example shown in Figure 4 complete hiding is effected with the 7-mil stripe so the hiding power is 458 square feet per gallon.

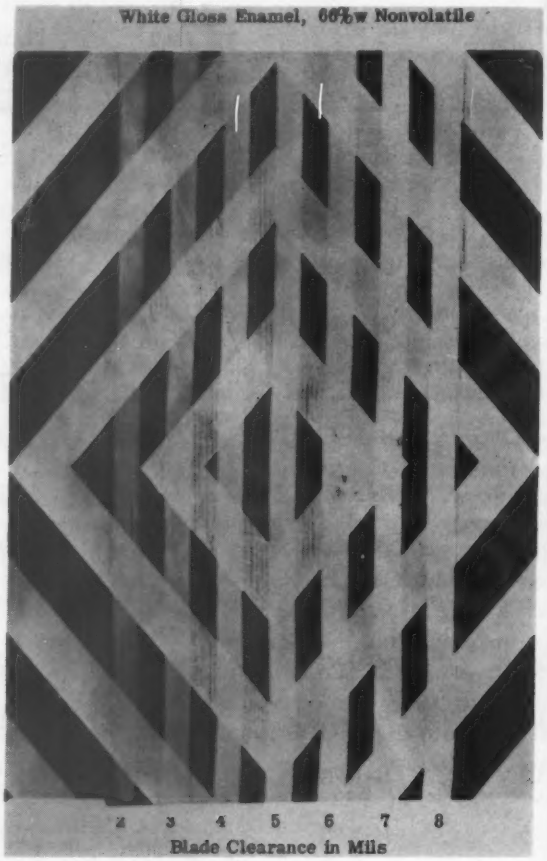


Figure 4. Illustration of hiding power as measured with the sag index blade.

Conclusions

A new tool has been developed for measuring the sagging characteristics of paints and for the rapid assessment of hiding power. The instrument is a film applicator which casts simultaneously seven ¼ inch mil stripes of paint of varying thickness. Sagging is rated in terms of the film thickness at which flow exceeds 25% of the original width of the film. This value is called the sag index. A good correlation was found between the Sag Index and ratings obtained from actual brush-outs. The hiding power of a paint can be rapidly determined from the film thickness which obliterates the pattern on a conventional hiding power chart.

Literature Cited

1. Bergen, J. T. and Patterson, W., Jr., Journal of Applied Physics, **24**, 712 (1953).
2. Los Angeles Paint and Varnish Production Club, Official Digest, **25**, 205 (April 1953).
3. Houston Paint and Varnish Production Club, Official Digest **28**, 560 (July 1956).
4. Patton, T. C., Official Digest **29**, 10 (January 1957).
5. Kansas City Paint and Varnish Production Club, Official Digest, **29**, 1086 (November 1957).

Dow vinyltoluene delivers low color, high gloss, snap dry with any drying oil

No doubt the most significant advantage of Dow vinyltoluene is its ready ability to modify all commercially important drying oils. With any of them—whether dehydrated castor, linseed, safflower, soya, menhaden, cottonseed, coconut or tall oil—Dow vinyltoluene consistently forms useful, sparkling-clear, high-grade and inexpensive vehicles.

This results in a wide choice of excellent vehicles to upgrade your paints and varnishes at less cost. The vehicles provide an unusual balance of properties, combining low color, high gloss and quick drying with better chemical resistance and durability.

For more information on Dow vinyltoluene, contact our nearest sales office. Or write THE DOW CHEMICAL COMPANY, Midland, Michigan, Coatings Sales Dept. 2204B.

YOU CAN DEPEND ON DOW

Dow Latex in paint primer guards T-Bird quality!

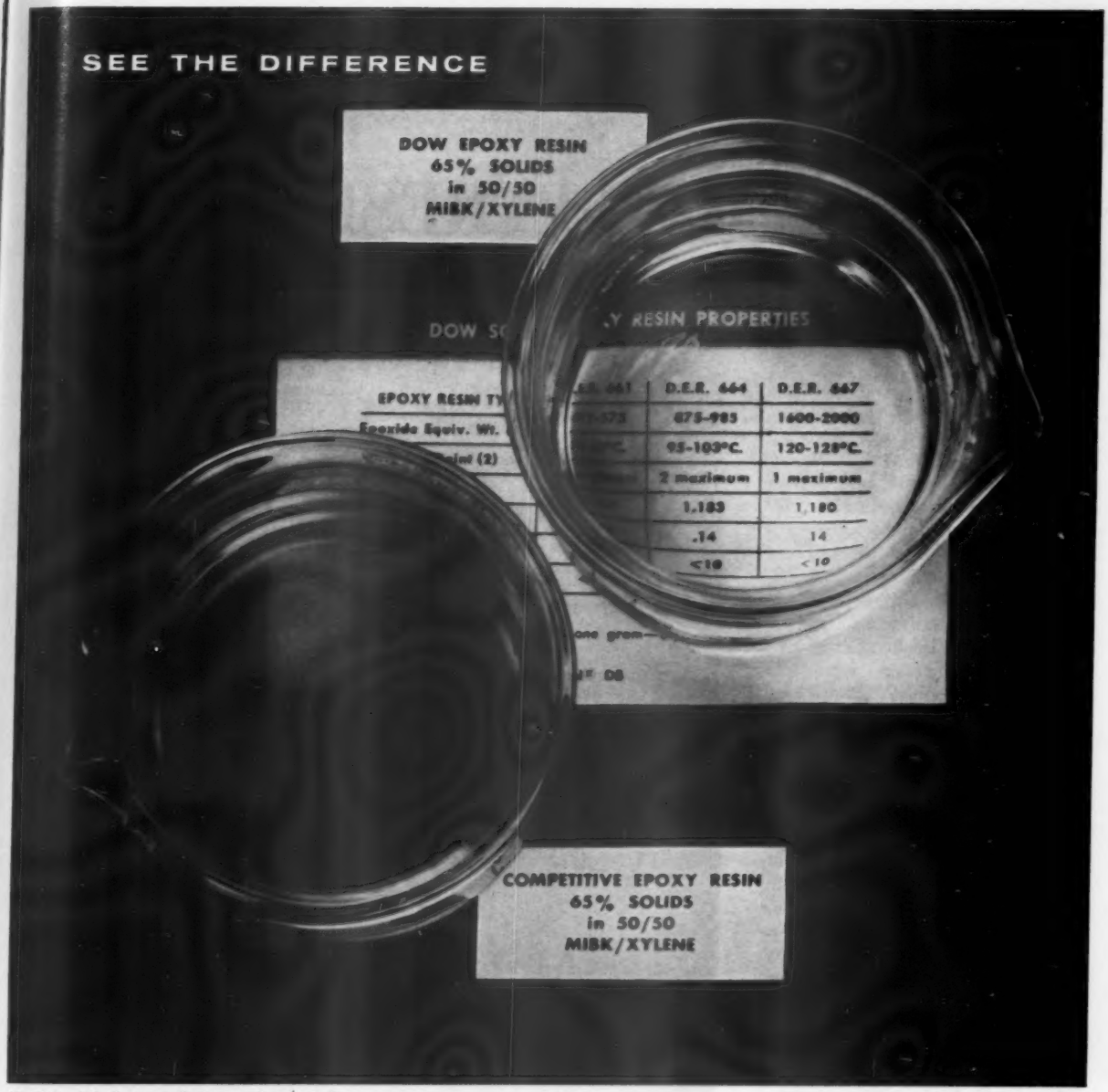
Rust won't take its toll in Thunderbird quality! The understructure of these sleek new models is thoroughly protected with a rust-preventive dip-coating of paint primer formulated with Dow styrene butadiene latex.

Are you all set to meet the growing demand for these revolutionary new paints for metal that offer your customers a lot more than beauty insurance? They eliminate fire hazard and costly solvent recovery systems because water replaces flammable solvents. Disagreeable odors are reduced. Safer working conditions and lower insurance rates can result.

Bring your paints for metal up to date now with Dow Latex and you'll add these features your customers want. For technical information on formulating with Dow Latex, write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Coatings Sales Department 2123J-1

LATEX T.M.

YOU CAN DEPEND ON DOW



For "clear" look at specification card, write to Dow.

"Pure" and "Clear" describe new Dow solid epoxy resins

The visibility test shown above vividly illustrates the clarity, purity and uniformity of Dow Epoxy Resin 667, one of three new solid epoxy resins developed by Dow.

The unique advantages of D. E. R.* 661, 664 and 667 are: (1) Nearly water-white color. (2) No need for filtering after cutting because these resins are free from salt and any small insoluble gel particles often found in standard solid epoxy resins. (3) Sodium content that is under 10 P.P.M. (4) And D. E. R. 661 is easier to handle and dissolve in solvents; it has a higher melting point so when flaked has less tendency to fuse in warm weather.

These properties are possible because Dow is a basic producer of epoxy raw materials and is able to assure quality control and a narrower range of specifications. For more technical data on Dow Solid and Liquid Epoxy Resins contact your local Dow sales office or write THE DOW CHEMICAL COMPANY, Midland, Michigan, Coatings Sales Department 2255K.

*TRADEMARK OF THE DOW CHEMICAL COMPANY

EPOXY

YOU CAN DEPEND ON DOW

SILICONE RESIN FOR COLD BLENDS

Finds application in the formulation of aluminum paints and high temperature baking enamels.

R-64* is a silicone resin designed for cold-blending with alkyd, melamine, and acrylic type baking enamels to give improved color and gloss retention, thermal stability and resistance to weathering. R-64 is available in solution form (65% in toluene). The color of this solution can be described as straw, Gardner 2 or less. Thinners recommend for R-64 are toluene, xylene, and hydrocarbons with a KB greater than 50. Blends of this silicone resin and alkyd resin pigmented with aluminum are claimed to possess equal high temperature properties as straight silicone-aluminum paints at reduced costs. It has been reported that even though the alkyd will volatilize at temperatures in the neighborhood of 500°F., the silicone will have sufficient stability to hold the aluminum pigment in place until it fuses to the substrate. This can be accomplished at concentrations as low as 10-20%.

*Product of Silicone Div., Union Carbide Corp.

Photograph shows a smoke stack at a chemicals plant coated with an aluminum paint based upon an experimental Union Carbide R-64 Silicone-organic blend. This stack is exposed to highly corrosive fumes, and after three years it shows no signs of flaking, corrosion, or weathering.

Aluminum Paints

Aluminum paints can be formulated to perform in the 500-1200°F range. These paints are recommended for aircraft engines, exhaust stacks, truck and auto engine manifolds and mufflers, furnaces, ovens, metal smoke stacks, etc.

It is recommended that high-leafing aluminum pigments be used in order to obtain optimum heat stability, while giving the metallic substrates the utmost protection from weathering and corrosive atmospheres.

Other metallic pigments that have found utility in modified silicone systems are stainless steel flake, nickel flake and bronze metal flake. Typical formulations for both baking and air dry systems are presented in Tables I and II respectively. It has been determined that certain alkyd resins are most suitable in aluminum paints because of their higher adhesion and film toughness. Generally, non-oxidizing short oil types give greater heat stability and color retention while oxidizing and long oil types are more easily cured. To obtain the best balance of cost with heat and weathering sta-

Pts. by Wt.	Ingredient	Manufacturer
10.7	Union Carbide R-64 silicone resin	Silicones Div., UCC
46.5	"Aroplaz" 906 X/B short oil non-oxidizing alkyd (60% non-vol.)	Archer-Daniel-Midland Co.
15.5	"Albron" 205 high leafing aluminum paste	Aluminum Company of America
27.3	Toluene	——

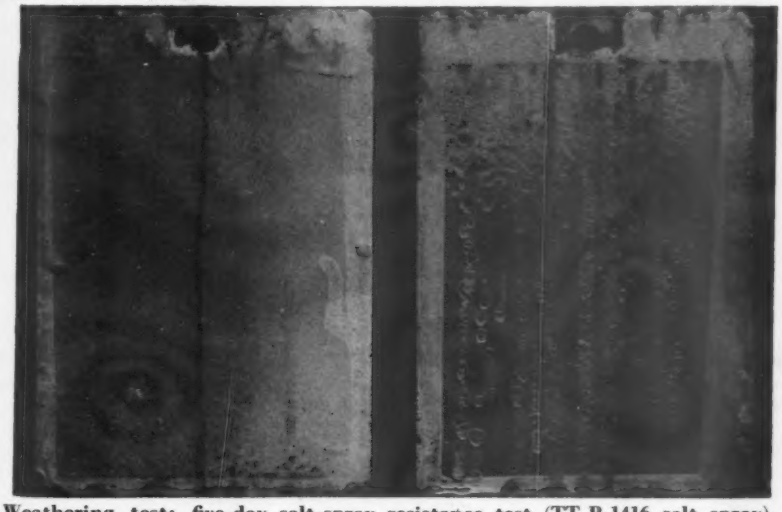
Instructions: Add R-64 and toluene to the alkyd and stir in aluminum paste until mixture is uniform. Cure 300-400°F. for 2 hours for optimum corrosion resistance.

Table I. Moderate baking heat resistant aluminum paint (45% non-volatile) formulated to meet MIL-P-20087A (baking).

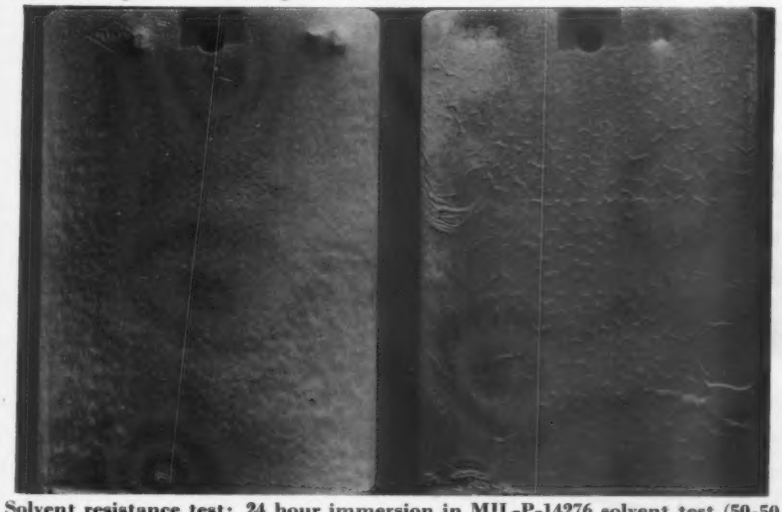
Pts. by Wt.	Ingredient	Manufacturer
7.0	Union Carbide R-64 silicone resin	Silicones Div., UCC
13.0	"Aroplaz" 906 X/B short oil non-oxidizing alkyd (60% non-vol.)	Archer-Daniel-Midland Co.
34.0	"Reynolds" 40 aluminum paste	Reynolds Metals Company
1.0	Ethyl cellulose — low mol. wt.	Hercules Powder Co.
10.0	Methyl ethyl ketone	——
35.0	Xylene	——

Instructions: Add R-64 and xylene to the alkyd and stir in aluminum paste. Dissolve ethyl cellulose in methyl ethyl ketone. Add ethyl cellulose-MEK solution to blended paint and stir until mixture is uniform. This formulation will air dry tack-free in 15 minutes at room temperature; however, bake-out for one hour at 300-400°F. will develop optimum corrosion resistance.

Table II. Air-drying heat resistant aluminum paint formulated to meet MIL-P-14276 (air drying).



Weathering test: five-day salt-spray resistance test (TT-P-1416 salt spray). Panel, left: 20% R-64 silicone/80% short oil non-oxidizing alkyd. Air drying aluminum paint. Panel, right: Same formulation without silicone.



Solvent resistance test: 24 hour immersion in MIL-P-14276 solvent test (50-50 xylene and mineral spirits). Panel, left: 20% R-64 silicone/80% short oil non-oxidizing alkyd. Air drying aluminum paint. Panel, right: Same formulation without silicone.

bility, one part silicone solids and four parts alkyd resin solids is recommended. Aluminum paste concentrations most generally recommended for optimum properties is 30% metal based on total resin solids.

Modified Baking Enamels

Silicone modification of many organic based-baking enamels is claimed to impart improved high temperature stability and resistance to yellowing, and increased protection from weathering and corrosive atmospheres.

R-64 is compatible with alkyds, acrylics, epoxies (low molecular weight types) ethyl cellulose, polyesters, and amino resins. It exhibits limited compatibility with nitrocellulose, phenolics and polyvinylbutyral. Any proportion of silicone to organic resin may be used, depending on the properties required or desired. High silicone concentrations usually increase gloss and color retention after aging; low silicone concentration results in less expensive formulation. Concentrations in the range of 10-30% silicone based on total resin solids is said to give the optimum balance of improved properties and cost savings.

Pigmentation

Correct pigment selection for a particular paint application is dependent upon specific conditions. Pigmented selected must be stable at desired operating temperatures. For example in the 200-400 degree F. range, rutile titanium dioxide, carbon black, red iron oxide, anhydrous magnesia, phthalocyanine green and blue are suitable. In temperatures above 400 degrees F., rutile titanium dioxide, ceramic blacks, cadmium selenide, chromic oxide and cobalt oxide are recommended. Pre-fused metallic salts to operate in the 1000-1500°F range can also be used in a cold blend of silicones with organic vehicles.

Extenders such as wet ground mica, calcium carbonate, silica, magnesium and aluminum silicates can be used in these silicone paint systems, but with some sacrifice in gloss of cured films.

Pigments must be milled to

(*Turn to page 54*)

HARSHAW

AURASPERSE COLOR W-6013

PHTHALOCYANINE GREEN

Outstanding dispersion for use in water systems

Service of the largest manufacturer of diversified water-dispersions of colors available for all formulation requirements

EMULSION PAINTS
Polyvinyl Acetate
Styrene-Butadiene
Acrylic

LATEX COMPOUNDS
PAPER COATINGS
LEATHER FINISHES

IMMEDIATE ATTENTION *will be given to your requirements for any aqueous color dispersion of* — Organic or Inorganic Pigment
Oxide or Earth Color
Full Strength or Reduced

FULLY ADJUSTED *to your formulation*
AURASPERSE *W-6013 Phthalocyanine Green*

best buy for — Compatibility
Stability
Uniformity
Formulation Ease

HARSHAW CHEMICAL CO.
1945 E. 97th Street
CLEVELAND 6, OHIO

HARSHAW

SAMPLES
and further information will be gladly furnished
ON REQUEST

Branches:
CHICAGO • CINCINNATI • CLEVELAND • DETROIT • HASTINGS-ON-HUDSON • HOUSTON • LOS ANGELES • PHILADELPHIA • PITTSBURGH

CONTROLLED THIXOTROPY IN

KELTROL 1059

PRODUCES SUPERIOR WORKING QUALITIES

Spencer Kellogg Research Laboratories have developed a new vinyltoluene drying oil co-polymer in odorless mineral spirits, trade-named KELTROL 1059. This is a superior material for flat wall paints, giving results comparable to the finest alkyd flats at a minimum cost. Try it in your laboratory. Prove for yourself the value of these features:

1. **Controlled thixotropy**
2. **Excellent color uniformity**
3. **Excellent non-penetration**
4. **No unpleasant after-odor**

Write to the Technical Service Department for Keltrol 1059 samples and technical bulletin with formulations.

KELTROL 1059
CHEMICAL CONSTANTS

Non-volatile...40% ±1
Viscosity...very soft thixotropic gel
Color...6; Acid Value...1.7
Specific Gravity...0.842
Weight per gallon...7.0

SPENCER KELLOGG AND SONS, INC.
BUFFALO 5, N. Y.

CONVEYORIZED PAINT WAREHOUSE

. . .SAVES SPACE, MOVES PRODUCTS AUTOMATICALLY, AND SPEEDS ORDERS.

A WAREHOUSE with an ultimate capacity of one million gallons of paint has been recently built in Great Britain at the Slough works of the Paints Division of Imperial Chemicals Industries Ltd. This remarkable warehouse was designed by I.C.I. engineers based on specialized experience, and embraces a number of conveyors with automatic operation. This warehouse, which is now in operation, has already effected considerable economies in distribution and storage.

Two features are of particular interest. The first is that finished products are moved from the filling department to the warehouse and from the collection points in the warehouse to the dispatch points by a conveyor system which carries them not only horizontally but also vertically to the upper floors as well.

The second is that the entire weight of the four-tier storage racks of the warehouse rests on the ground and not on intermediate floors. Apart from the ground floor, the other three floors are hung between the racks.

Many economies in handling costs and speed of dispatch have been achieved and it is now possible, for example, to make up and dispatch in 1½ hours a complete order, packed for long-distance delivery, which by earlier methods took as long as 24 hr. In the former one-story warehouse, storage capacity (including reception and dispatch areas) was 7 gal./sq. ft., of ground floor space, whereas in the new building it is 30 gal./sq. ft. (See Figure 1)

Site Problems

The problems that faced the designers of the warehouse was to provide on a site only 400 ft. by 330 ft.,

Figure 1. High racks under construction.

the most efficient possible storage and despatch facilities for the paints division's 7,000 stock items. Demand for most of these fluctuates considerably according to the season—and even according to the weather—and orders from customers vary from a few pints to hundreds of gallons. (See Figure 2)

To insure sufficient stocks for prompt service, it was decided that the new warehouse should have a capacity of about 1,000,000 gal., and on the site available this necessitated a four-story building. The high loads resulting from such a quantity of paint stored on shelves would have made conventional building methods uneconomic, and the method

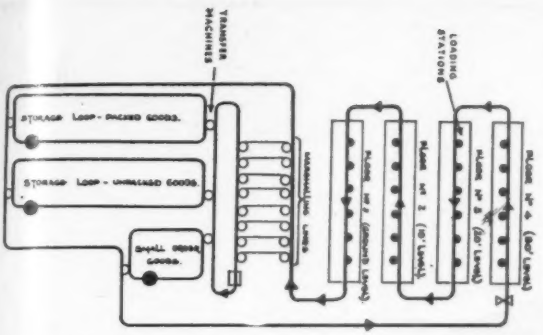


Figure 2. Main conveyor assembles items. Subsidiary loops arrange them for packaging and dispatching.

adopted was to build 40 ft. high storage racks and suspend the three upper floors from the racks. Thus, the outside walls are mere shells, all the weight being taken on the ground floor through the thousands of vertical members of the racks.

Overhead Conveyor System

To cut manual handling to a minimum, an overhead chain conveyor system (Figure 3)—in all 3,000 ft. long—conveys the cans of paint right from the filling department (Figure 4) to the warehouse storage area and from the storage area on to the packing and dispatching departments. The conveyor system utilizes trays suspended from trolleys running on a chain, which travels at 40 to 45 ft/minute. Each tray can carry up to 5 gal. of paint.

When the cans come from the filling lines they are loaded on to trays, and a control key on the trolley is set according to the floor of the warehouse for which that particular tray is intended. The tray will then be automatically shunted off at the correct floor and the cans stacked, by hand, according to type, size and color. (Figure 5)

A conveyor system along the central gang-way on each floor level is used to assemble orders in the storage area and deliver them to the packing area. The warehouse is divided into zones, each of which has an assembler responsible for making up orders (or even part orders) relating to the type of paint stored in his area. He receives his instructions from the conveyor operator by a pneumatic tube system. Then, using a specially designed trolley incorporating a step ladder, he collects the different items specified on the order sheet and takes them to a loading station in the gangway which has automatically received an empty tray. When he has loaded the tray he operates a control to send it back on to the conveyor, first marking the order number on a small flag and adjusting a control key. This key selects the marshalling line (there are eight of these at the end of the conveyor system), for which the tray is intended. Each assembler always sends his trays to the same marshalling line.

Back on the conveyor, the tray automatically reaches its selected marshalling line. At the same time, other trays relating to the same order will be arriving on other marshalling lines from the other assemblers. When the order is complete, the con-

(*Turn to page 89*)

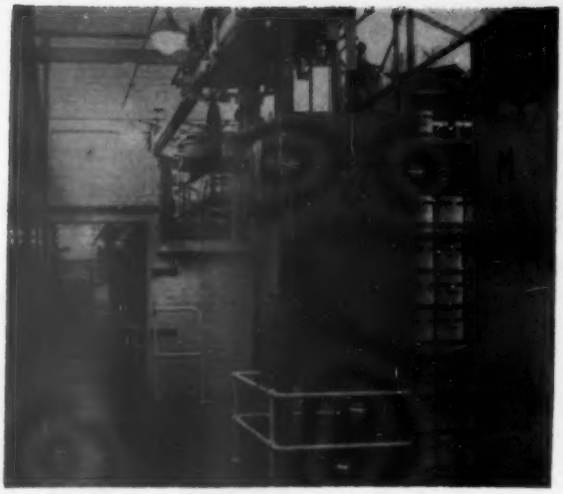


Figure 3. Loading stations along the gangway. At each of these points cans of paint are put into empty conveyor trays which have been removed from the overhead conveyor truck and lowered to a convenient height.

Figure 4. In the control position, the conveyor operator using a pneumatic tube installation and a loud speaker sends orders to the assemblers stationed throughout the storage area. The operation shown here is the stamping of sequence numbers.

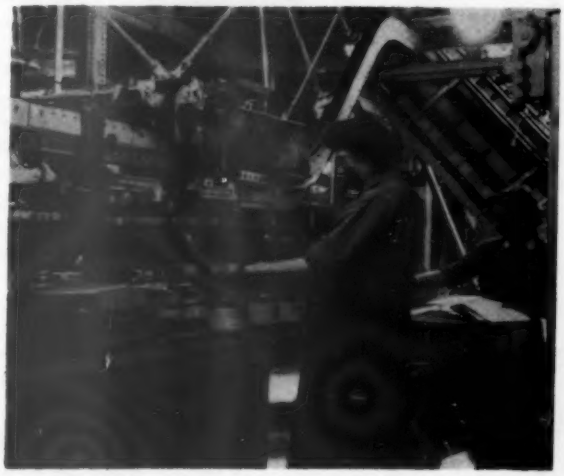
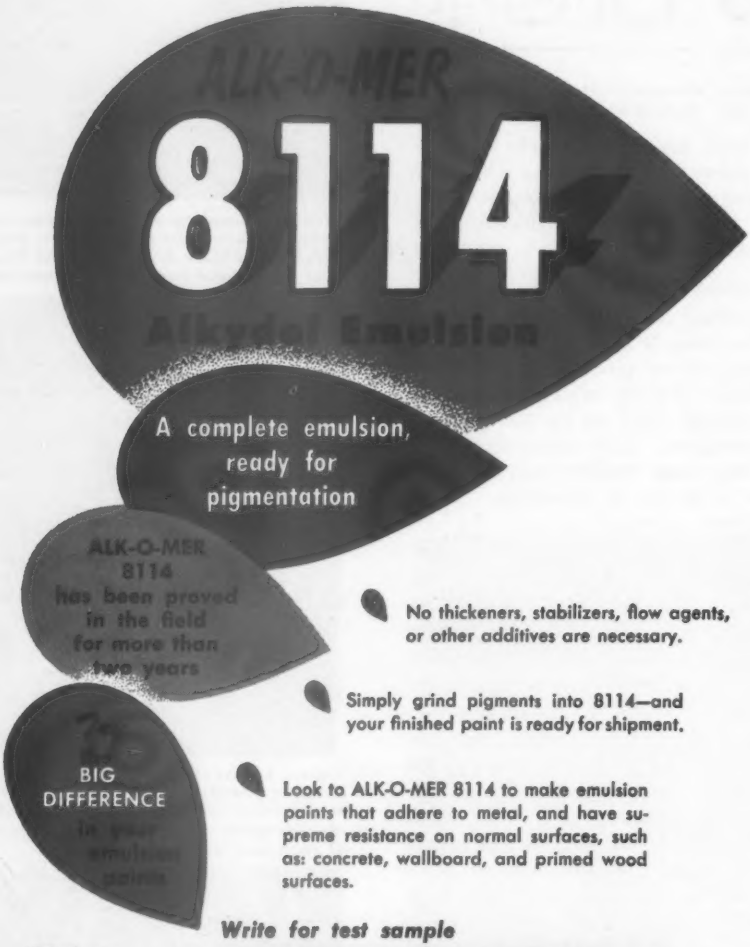


Figure 5. Cans of paint are pulled from the conveyor tray on to a roller conveyor and are checked as they are passed to the packing area.


ALK-O-MER
8114
Alkydol Emulsion
A complete emulsion, ready for pigmentation
ALK-O-MER 8114 has been proved in the field for more than two years
BIG DIFFERENCE

No thickeners, stabilizers, flow agents, or other additives are necessary.

Simply grind pigments into 8114—and your finished paint is ready for shipment.

Look to ALK-O-MER 8114 to make emulsion paints that adhere to metal, and have supreme resistance on normal surfaces, such as: concrete, wallboard, and primed wood surfaces.

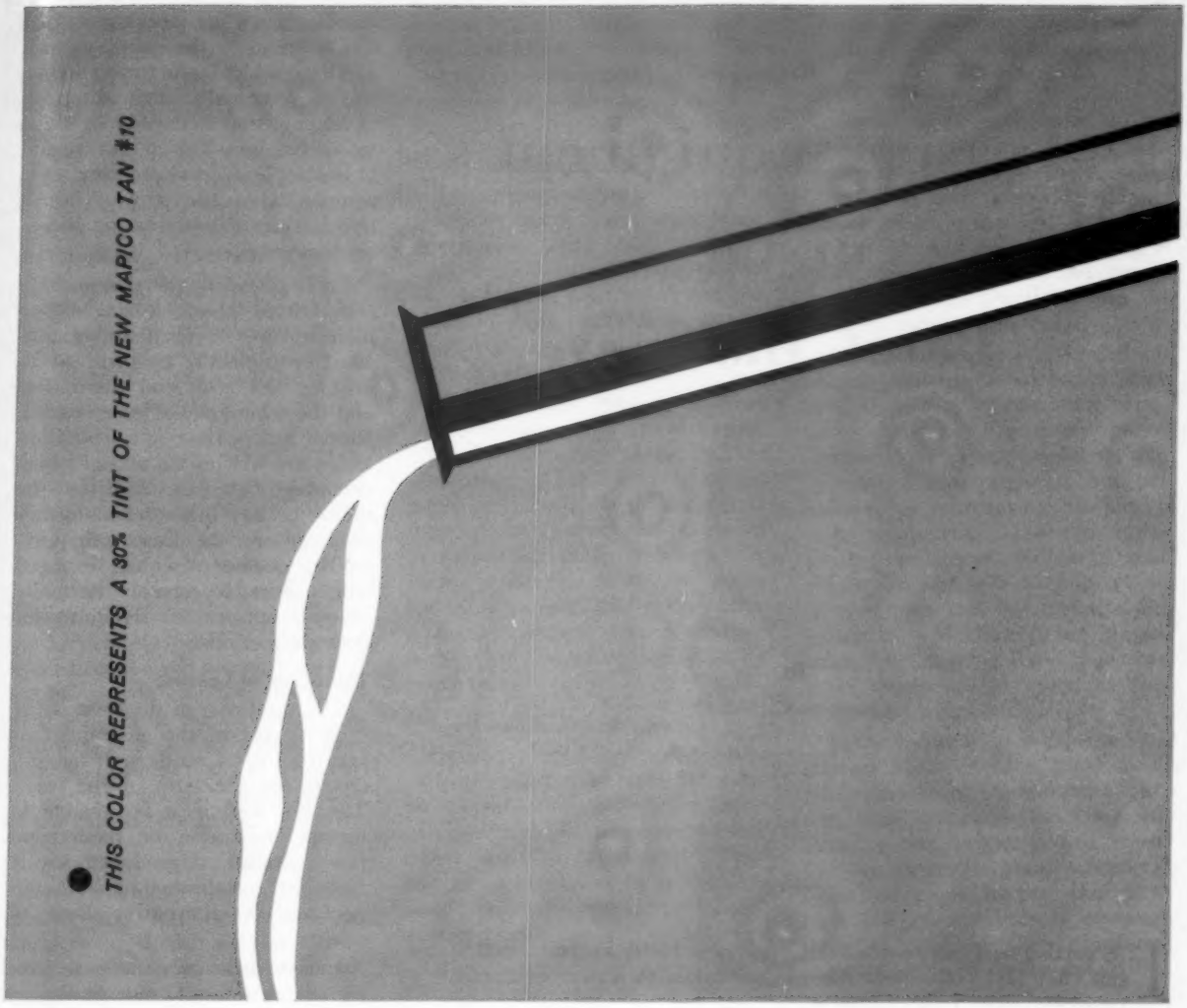
Write for test sample

Telephones:
Chicago—Bishop 2-1374
Cicero—OLympic 2-7740

ALKYDOL *Laboratories, Inc.*

3230 South 50th Avenue, Cicero, Illinois

Representatives:
W. R. Husen Co., East Orange, N. J.
C. L. Zimmerman Co., Cincinnati, Ohio
Pacific Coast Chemicals Co., Berkeley, California
Harwood J. Cranston, Sewickley, Pennsylvania
George B. Horsfall, Grosse Pointe, Michigan



STABILITY

MAPICO COLORS

Yellows
Tans
Reds
Browns
Black

For sheer indifference to the ravaging effects of alkalis... Mapico synthetic iron oxide pigments have no peer. Inherent to this stability is the characteristic strength of iron oxides. Added to it are the precise quality standards to which every Mapico pigment must be the equal.

The fruit of years of tireless research into improved production techniques, Mapico iron oxides will provide the stability your product demands.

And with Mapico you take advantage of permanence, high hiding power, effective UV screening, good suspension, freedom from abrasion and complete uniformity batch after batch, year-in and year-out. For full information and samples, write today.

COLUMBIAN CARBON COMPANY
380 Madison Avenue, New York 17, N. Y.

PRODUCERS OF COLUMBIAN COLLOIDS:
synthetic iron oxide pigments, carbon black, carbon black dispersions

Leasing Equipment in the Paint Industry

By
Clarence C. Kane*

IT'S getting so I can rent a new suit, hat and coat more conveniently than I can buy," a company president remarked recently. To some paint, varnish and lacquer manufacturers, this little pleasantry may not seem especially strange, since many of them rent all their new stainless steel vats, agitators, high speed mills, heating equipment, piping equipment, mixers, laboratory equipment — in fact the full gamut of machinery and equipment. To other manufacturers, this leasing trend may be something new.

Leasing of income producing equipment seems to have started back in New York State in 1845, when the Schuykill Navigation Company purchased transportation barges to lease to operators who wanted to use them without having to spend their own capital funds. At least, this seems to be the first recorded event of this kind. Since those palmy days, every industry in the United States has taken to leasing equipment.

Why leasing? Leasing is no cure-all, no infallible solution to all the financing problems of business. Leasing has certain virtues just as other forms of financing have other virtues. Unlike other financing, however, leasing involves no dilution of ownership or control, it necessitates no periodic cleanup of funds or pledge of receivables. Ordinarily, only the lease rental payments due within one year will appear on the balance sheet. The portion due beyond one year will usually appear only as a footnote.

Frees Working Capital

The major virtue of leasing is that it frees working capital for company expansion of sales, for taking of all trade discounts, for building balanced inventories for seasonal needs, for making more credit available to customers, for expanding research and development work—in short, for all the customary uses of working capital.

The trend in the paint, varnish and lacquer manufacturing industry is so markedly in the direction of leasing, that it may be of value to discuss how leasing works, and in dollars and cents see *why* some companies in the paint, varnish and lacquer manufacturing industry lease equipment.

To begin with, there is nothing complicated about leasing. The manufacturer determines exactly what equipment he wishes to acquire, its cost and supplier—and the tenure of the lease desired. United States Leasing Corporation leases are written on straight line, declining balances, sum of the digits, or any other schedule tailored to suit the leasee's requirements. Lease plans are arranged from one to 10 years, and normally renewal options are available for extended periods.

Total Cost of Leasing

The total cost of the lease is the original cost of the equipment or facility, plus moderate leasing charge for the term of the lease. Through leasing, it is possible to finance expansion or modernization without dependence on a company's established banking connections or alternative lines of credit.

Inasmuch as *only* the lease payments due within 12 months appear as a liability on the financial statement, the ratio of current assets to current debt, as well as the ratio of net worth to total debt are affected very little.

But while leasing is simple enough, the simplest method by which a manufacturer can acquire new equipment is to take the cash out of his working capital and use that to make the purchase. Yet, despite the fact that this is simpler, some manufacturers prefer to lease. Why?

Relative Cost Figures

The answer lies in the relative cost figures. For example, if a manufacturer takes $10,000 out of his working capital (or a multiple thereof) and uses that to acquire new equipment, he is obviously paying something for the use of that money. Since every dollar of working capital has earning power, the investment of $10,-

*Vice-President, United States Leasing Corp., San Francisco 4, Calif.

000 in new equipment must return to the company *at least* the same profit which the company can earn with this $10,000 in other ways.

How much does the typical manufacturer earn on working capital in the paint, varnish and lacquer industry? In this industry, the typical manufacturer earns 10.56 per cent net profit on net working capital. These are the Dun & Bradstreet average earnings for net working capital in the industry (see: *Twenty-Five Years of the 14 Important Ratios*, Dun & Bradstreet, 1957, p. 60). These findings jibe closely with the data gathered by United States Leasing Corporation from its own clients.

It is important to bear in mind that the 10.56 per cent refers to profits *after* taxes. Since all of the corporations in the sample are in the 52 per cent bracket, the profit *before* taxes on net working capital is approximately double the figure cited. In short, the typical manufacturer in the paint, varnish and lacquer business earns annually on his net working capital, about 23 per cent before taxes.

Simple Choice

Every manufacturer in the paint, varnish and lacquer business is therefore faced with a simple problem. If he uses his own working capital to buy new equipment, and if his funds earn 23 per cent before taxes, then by buying he is paying 23 per cent for the use of his money tied up in the equipment. This is without regard to the effect of depreciation. Should he do it?

Of course, while this return on net working capital is average for the industry, some manufacturers earn more, and some may earn less. On the average, a paint, varnish and lacquer manufacturer turns his net working capital about 4.5 times a year. Some manufacturers in this industry may do better; others may not. Obviously, if working capital turns at all, it should mean earnings.

It is important, therefore, that a manufacturer examine his own ratios to see how often his working capital turns, and precisely what the investment of his own working capital in equipment would cost him directly. If outside financing through leasing can be acquired at less cost than the manufacturer's use of his own working capital, then certainly it is sounder to use leasing. If not, it is sounder to buy.

Profit in Expansion

In general, leasing is most beneficial for those companies whose operations could expand profitably if additional working capital, in the form of equipment and machinery, were available at smaller annual expense than through use of their own capital.

Nothing has been said here about the tax advantage in leasing. This is debatable. Actually, the advantage of the lease arrangement lies principally in the way it frees dollars, otherwise invested in ownership of fixed assets, for more profitable uses. In some special situations, leasing does offer a tax advantage, but few companies are in those special circumstances.

Other Possible Advantages

Leasing offers other possible advantages—but these also are only for special situations. Some companies would like to convert fixed assets into current assets. This may be accomplished by selling the asset for cash and immediately leasing it back.

Other companies are faced with a competitor who is using the latest equipment, while they themselves are lagging behind on cost-saving. Here acquisition of new machinery is a must, but financial ratios may not permit outright purchase, or purchase on a conditional sales contract, or even bank borrowing to make the purchase. Leasing offers a tested expedient to accomplish the end desired.

Still other companies hold a tight checkrein on capital expenditures and financial ratios, although the president or division manager may feel it mandatory that certain new equipment or facilities be installed. Even if the equipment is purchased on credit plan, it decreases the ability of the concern to borrow in other directions. The leasing of a fixed asset has a similar effect, but only to the much smaller extent of the annual rental. As a result, leasing meets the problem of the tight checkrein on capital spending or financial ratios—and without forcing the board of directors to raise more capital.

Rapid Obsolescence

Again, some companies do not like to face the problems of large investment in equipment when there is a strong possibility of rapid obsolescence. Leasing by-passes the problem of large investment in such equipment and permits a user to acquire the latest and the best on a short-term lease.

Also, the whole problem of inflation has begun to cause some soul searching in corporate treasurers' offices. For many years, corporations have thought nothing of renting real property, but yet insisted on purchasing machinery and equipment. Due to inflationary pressures, industrial real estate has not only held its value in most instances, but has actually enhanced. Machinery and equipment, on the other hand, must always depreciate in value as the equipment wears out.

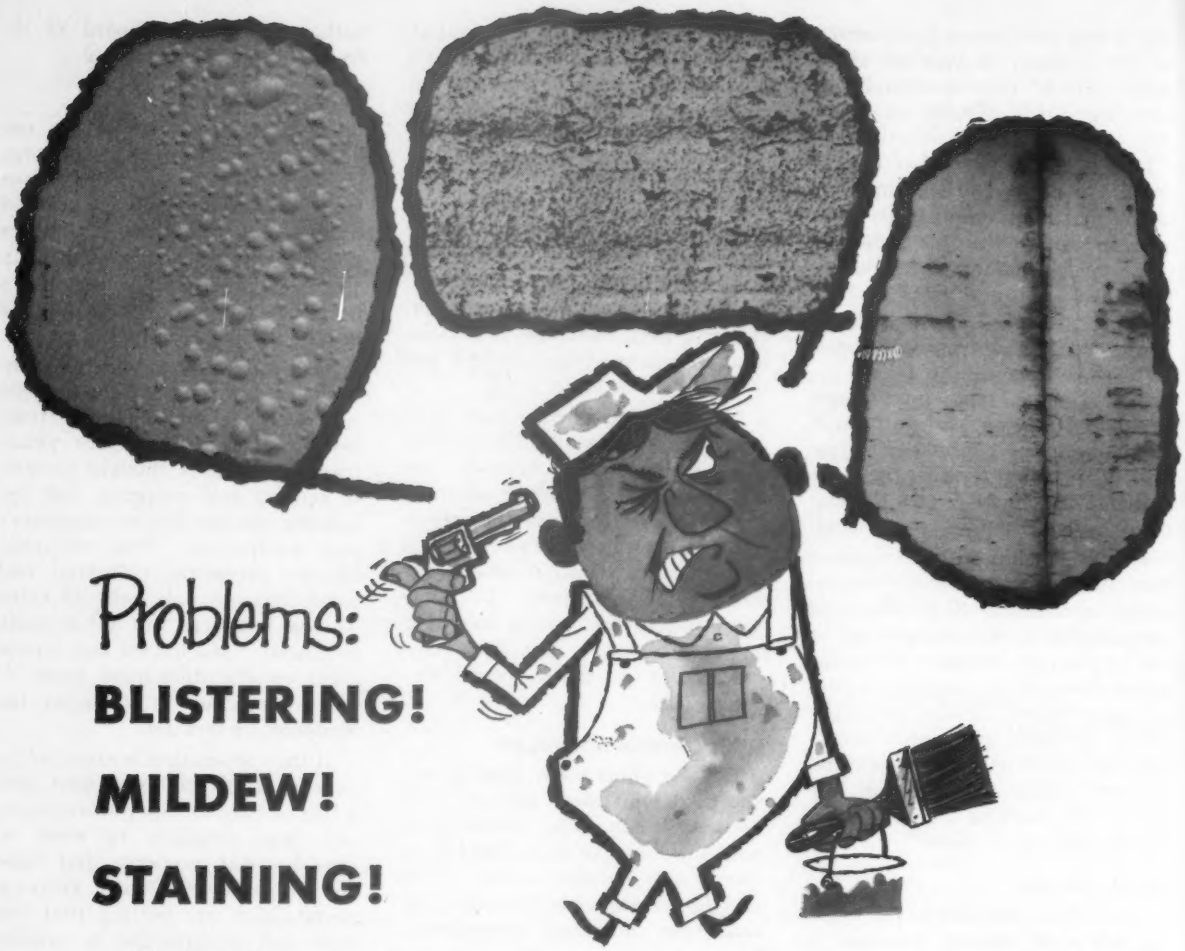
If the corporation is expected to expend $2,000,000 on plant and a like amount on equipment, might not that company be wiser to own its real property and lease the equipment? Many corporations today are finding that the high toll of inflation is causing them to readjust their thinking as to which fixed assets should be purchased and which leased.

Business Liquidity

Finally, the desire to maintain business liquidity has led many companies to lease instead of buy. In the paint, varnish and lacquer manufacturing business, the ratio of "quick assets" to current liabilities dropped from 3.49 in the middle of 1954 to 3.20 in the middle of 1957.

This decline of liquidity is in part due to the impact of federal tax legislation providing for a speed-up of corporate tax payments. In part, it is also due to the greater demand for credit by business customers.

The upshot is that many manufacturers in this industry have turned to leasing, thereby conserving working capital. True, this situation may not affect all companies in this field, but it evidently affects enough to make the trend marked.



Problems:

BLISTERING!

MILDEW!

STAINING!

Solution: Formulate your flat house paints with EAGLE-PICHER Zinc Oxides!

New low-luster or flat-breather type house paints have been able to solve some of the problems posed by wide differences in today's building materials, but they also have created other hazards—blistering, discoloration by mildew growth, and unsightly staining.

Now, extensive testing proves that these hazards can best be solved by including zinc oxides in your formulations. And the surest way to provide your low-luster house paints with superior mildew resistance, excellent blister resistance, minimized tannin staining and better tint retention is to *insist on Eagle-Picher Zinc Oxides.*

Since 1843

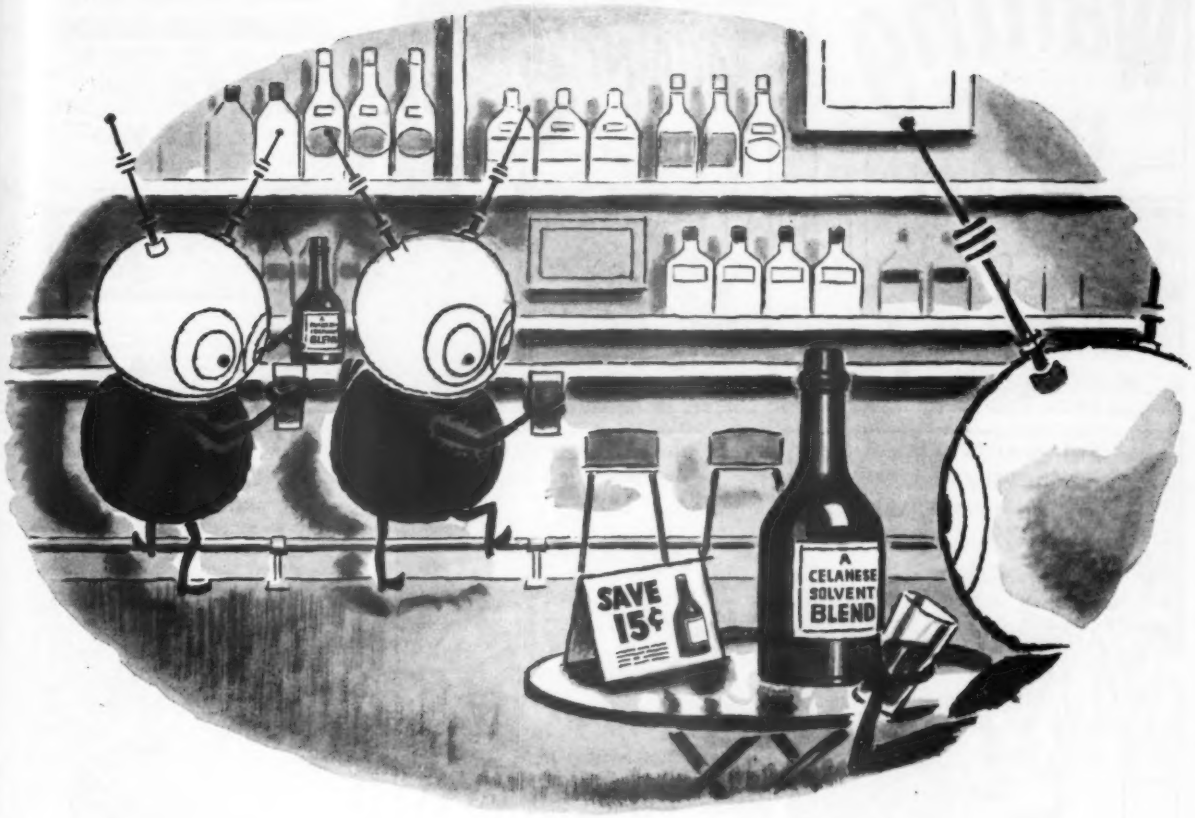
EAGLE EP PICHER

EAGLE-PICHER

The Eagle-Picher Company • Cincinnati 1, Ohio

Regional sales offices: Atlanta, Chicago, Cleveland, Dallas, New York, Philadelphia, Pittsburgh

West Coast sales agent: THE BUNKER HILL COMPANY, Chemical Products Division
Seattle • Portland • Oakland • San Francisco • Los Angeles • Kellogg, Idaho



"Imagine! Smart Formulators save 15¢ a gallon using this blend as a replacement for normal butyl alcohol in nitrocellulose lacquers!"

Why? Because the physical properties of this blend of Celanese Solvent 301 and CS 901-H, its solvent power, and its rate of evaporation, are almost identical with those of butanol, and therefore permit formulation of the same high quality lacquers—but at better than 15¢ a gallon lower cost.

Celanese Solvent blend, an alcohol mixture specifically developed as a low-cost substitute for normal butyl alcohol, makes an excellent replacement in printing inks, amine resins, and other systems in which butanol is used. It can be used to reduce butyl acetate in the same manner as butanol, and the resulting mixtures have the same toluol dilution ratios.

For assistance in your evaluation of blended Celanese Solvent 301 and Celanese Solvent 901-H, consult Celanese Technical Service and Applications Laboratories. And for information as to how you can use it as a low-cost replacement for normal butyl alcohol in your formulations, write for working samples, prices, and technical data sheets. Celanese®

Celanese CHEMICALS

Celanese Corporation of America, Chemical Division, Dept. 558-H, 180 Madison Avenue, New York 16, N. Y.

Export Sales: Amcel Co., Inc., and Pan Amcel Co., Inc., 180 Madison Avenue, New York 16, N. Y.

See Chemical Materials Catalog and Chemical Week Buyers' Guide for complete listing of Celanese Chemical Products

The Case Of The
wailing wife
YOU MEAN YOU HAVE TO WORK LATE AGAIN?
SORRY, HONEY...STILL HAVING TROUBLE WITH CONTAMINATED SOLVENT. I'LL BE HOME AS SOON AS I CAN!
CLICK
CONTAMINATED SOLVENT EH? WE HAD THE SAME TROUBLE! WHEN JIM GETS HOME YOU TELL HIM!
...AND HE SAID SKELLYSOLVE WAS THE ANSWER FOR THEM! HERE, I WROTE IT ALL DOWN.
HMM, IT SAYS SKELLYSOLVE IS CHECKED DURING PRODUCTION AND BEFORE SHIPMENT!
AND NINE OUT OF TEN CARS ARE SHIPPED THE DAY AFTER THE ORDER IS RECEIVED! WOW, I'LL CALL 'EM TOMORROW!
YOU SAY YOUR TECHNICAL SERVICE IS BACKED BY 25 YEARS' EXPERIENCE? GREAT...I'M SOLD!!
ONE MONTH LATER
JIM NEVER WORKS NIGHTS ANYMORE!!
THANKS AGAIN FOR YOUR TIP ON SKELLYSOLVE!

Skellysolve for Paint, Varnish and Lacquer Manufacture

SKELLYSOLVE-L. A quick - evaporating lacquer diluent of exceptionally sweet odor. Closed cup flash point about 12°F.

SKELLYSOLVE-S. Low end point mineral spirits for thinning paints, varnishes, and polishes. Closed cup flash point about 103°F.

SKELLYSOLVE-S2. A quick - evaporating mineral spirits. Closed cup flash point about 101°F. Excellent for industrial paints and for polishes and waxes.

SKELLYSOLVE-V. Narrow boiling range VM&P naphtha. Excellent for dip and spray enamels. Closed cup flash point about 50°F.

SKELLYSOLVE-T. High boiling mineral spirits for longer wet edge. Closed cup flash point about 140°F.

SKELLYSOLVE-X. A heavy, slow drying naphtha having a high flash point. Used to increase the wet edge time, to give better flow and leveling characteristics tending to eliminate brush and lap marks in hot weather.

Ask about our new Skelly Petroleum Insoluble Grease and wide range of aromatics.

SKELLY **Skellysolve**

SKELLY OIL COMPANY

Industrial Division

605 West 47th Street, Kansas City 41, Mo.

NEWS

New Colortrend Report Shows Increase in Beige

The California Ink Co., Inc., has recently released the Summer 1958 Colortrend Report.

Highlights of the report (covering the six month period ended May 31, 1958) are the tremendous increase in popularity of beiges, off-whites, and grays.

It seems that the blue wave has not yet reached the mass market. Only one blue, a fairly strong Dresden Blue, shows continuing strength. This might presage a rise in the blue family in the coming year.

The trend towards lighter pastels continues in practically every color family.

Turquoise and pink are the number one and two colors in the home decorating field today.

The Colortrend Reports are based on the sales of a wide range of tubed colorants to 227 paint manufacturers all over the United States.

•

Morningstar Acquisition

Morningstar-Paisley, Inc. announced that an agreement has been signed for the acquisition of Thurston & Braidich, importer and processor of water-soluble gums, for an undisclosed amount.

Thurston & Braidich management will move from its present location to Morningstar's New York offices at 630 W. 51st St.

•

Shell Expands Glycerine

The Shell Chemical Corporation has announced that it has awarded contracts for the construction of the remaining facilities in the glycerine production program at its Norco, La. plant. Cost of this phase of the program was estimated at more than $10 million.

One unit will produce acrolein. A second will make glycerine, using acrolein and hydrogen peroxide from a unit the company completed earlier this year.

Other construction includes extensions to the utilities system and other off-site facilities, as well as additions to shops, warehouses, and the office building.

The Norco plant is expected to make about 35 million pounds of glycerine a year plus substantial quantities of acrolein.

Construction is expected to be completed by late next year.

•

Air Reduction To Build

The Air Reduction Chemical Co. announced plans for the construction of a new laboratory and office building at Piscataway Township, N. J.

Also, the company announced that an extensive pilot facility would be built at the same location. The two projects will cost over $1,000,000.

The new laboratory, which is planned as an auxiliary to the firm's existing pilot plant development laboratories at nearby Bound Brook, N. J., will provide facilities for increased technical services and applications work in the field of chemicals derived from acetylene.

•

Dow Upgrades Glycerine

Production of three grades of glycerine which are purer than their previous counterparts are now claimed to be possible because of new processes developed in the Texas division of the Dow Chemical Co. at Freeport.

A new plant recently placed on stream also doubles the capacity for synthetic, 96% USP, and 99.5% USP grades.

All three grades of glycerine will continue to be marketed through the company's regular nation-wide distribution system.

•

Planes Marked With Paint

James T. Pyle, Administrator of Civil Aeronautics, has ordered the 92 aircraft operated by the CAA to be distinctively marked with daylight fluorescent paint to make them more visible in the air and thereby further reduce the possibility of mid-air collisions.

The CAA aircraft will be painted with a new design in which 15 to 20 per cent of the aircraft will be covered with "blaze" orange fluorescent paint bordered in black.

•

Representative Appointed

The Landers-Segal Color Co. has announced the appointment of Hayward Heubeck Co., Baltimore, Md., as sales representative for the areas of Maryland, Virginia, and Washington, D. C.

Mr. Heubeck will have charge of handling the sale of the firm's colors, flushed colors, and water dispersions.

TRAFFIC MARKING PAINT: Despite extreme weathering, high octane gasolines, and snow removal chemicals, marking paint currently in service at Quad City Airport in Moline, Ill. has demonstrated extraordinary durability. Paint is based on Pliolite VT, a solution resin recently introduced by Goodyear Chemical Division, and formulated by Sandstrom Products Co. of Port Byron, Ill.

NEWS

Five-Year Write-Off Survey Conducted By Kidde

A five-year write-off provision for corporations would not significantly increase capital spending by industrial firms in 1958 and 1959, according to results of a survey released by Walter Kidde Constructors, Inc.

A total of 225 companies with combined 1958 capital budgets in excess of five billion dollars responded to questionnaires.

It was pointed out that the respondents account for approximately 16 per cent of estimated U. S. capital expenditures in 1958.

The survey also indicates that industry plans to spend less in 1959 for capital equipment than in 1958.

In response to questions about the possible effects of legislation that would permit a five-year depreciation of new capital facilities, 52 companies, with combined 1958 capital budgets of $785 millions, said they would increase spending in 1958 by $156 millions. The remainder of the companies, 173 in number with combined 1958 capital budgets of $4237 millions, said five-year write-off provisions would not influence them in increasing their '58 capital expenditures.

Projecting into 1958, 78 companies with combined '58 budgets of $980 millions would increase their '59 spending by $188 millions. However 148 companies, with combined 1958 budgets of $4042 millions, reported they would not increase their '59 spending because of a five-year write-off provision.

•

Lehigh Offers Courses

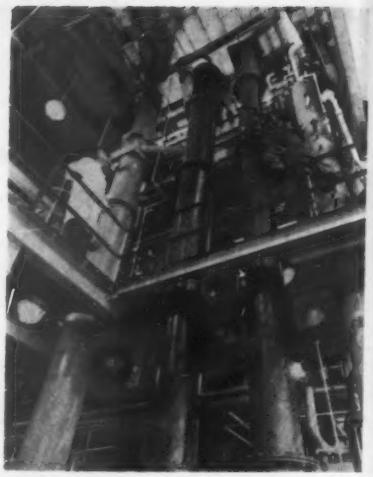
Dr. Harvey A. Neville, provost and vice president, has announced that two new courses in instrumentation have been added to the chemistry curriculum at Lehigh University.

The new additions have been designed to coordinate and emphasize information presented in elementary physics and chemistry courses.

The first course, "Instrumentation Principles," will deal with a study of the electronic, optical, and mechanical principles used in modern instrumentation for measurement and control.

The second new course, "Instrumentation-Transducers," will be a study of the fundamentals of primary sensing elements, electronic and mechanical recording systems, pneumatic and electromatic indicating and controlling elements.

TALL OIL SHIPMENT: What is believed to be the largest, single export shipment of tall oil rosin was made recently from the Savannah plant of Union Bag-Camp Paper Corp. The shipment, totalling 800 metric tons, is destined for Japan. Shown here being loaded aboard ship, shipment consisted of 3500 standard galvanized rosin drums.



SEMI-WORKS PLANT: Opened for operation August 1 by General Electric Co. at Pittsfield, Mass., plant is designed to produce increased quantities of Lexan polycarbonate resin for market development work.

Louisville Club Symposium

The Louisville Club of the Federation of Paint & Varnish Production clubs plans for the fourth consecutive year, a technical symposium on the general subject, *The Effect of Pigment Physical Characteristics on Film Properties.* Because of the scope of the subject, discussion will be limited to extender and white pigments.

The meeting will take place on Monday, March 2, 1959 in Louisville, Ky. at the Sheraton Hotel.

Address any communications to: Mel Irwin, c/o Porter Paint Co., Dept. PVP, Louisville, Ky.

•

Brookfield Expands

A 3,000 square foot addition to the Brookfield Engineering laboratory in Stoughton, Mass. has recently been completed.

The new facility has been designed primarily for the development of new automatic viscosity recording and control systems.

Donald Brookfield, vice president in charge of research and development, will direct the new facility.

•

Armour Moves

Armour & Co. has moved its general offices from 4301 South Racine Ave. to 401 North Wabash Ave., Chicago.

Offices of the Armour & Co. Chicago plant and research laboratories will remain at 1425 W. 42nd St.

NEWS

Continuous Flow System Solves Laboratory Problem

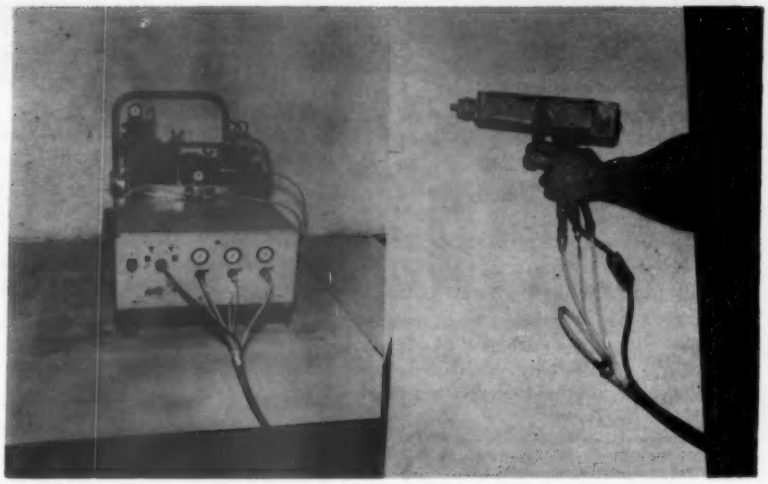
Two years of intensive work by the Nobelist Dr. Albert Szent-Gyorgyi and Josef Blum, director of development for Ivan Sorvall, Inc., have resulted in the successful conclusion of a practical problem that had baffled laboratory researchers for many years.

The problem, that of separating and collecting a few grams of material from a large volume of sample, as for instance in the preparation of myosin, had hitherto been a cumbersome and costly operation.

What was needed was a device to feed sample continuously into individual test tubes contained in a compact rotor, while that rotor was revolving at superspeeds in excess of 16,000 rpm. This is what has been achieved.

The Servall SS-1 Superspeed Angle Centrifuge equipped with the Servall "Szent-Gyorgyi & Blum" continuous flow system.

The Servall "Szent-Gyorgyi & Blum" continuous flow system enploys a reservoir containing sample that is admitted to superspeed centrifugation at controllable flow rates of up to 200 ml per minute. The precipitate is harvested in 8, 4, 2, or even one test tube, in a continuing, non-stop operation. The exhausted sample, or supernatant, is passed off into an adjacent jar. The design is such that the sample contacts only stainless-steel except for the drain tube. The device that distributes the sample to the various tubes is designed into a special rotor cover.



POLYAMIDE TUBING: Installation of Nylaflow tubing is simplified as no pre-forming is required and tubing is easily bent to desired configuration. In casing, left, less than one inch OD encloses all five tubes between pumping unit and spray gun. Translucent tubing walls permit visual check of fluid flow at all points throughout chemical spray equipment. Tubing can carry 100 per cent reactive epoxy resin, hardener, hot water, and air to chemical spray gun, as pictured on right. No defects or sign of wear have appeared in installation or in service for more than a year.

•

Florida Convention

A seminar on the cause and cure of efflorescence on masonry surfaces was a highlight of the June convention of the Florida Council, Painting & Decorating Contractors of America, held in Jacksonville on June 19 and 20.

The efflorescence problem was outlined by Gerould Allyn, coatings specialist with the Rohm & Haas Co.

Mr. Allyn illustrated his talk with slides of efflorescence on a wide variety of masonry surfaces in Florida, California, and other regions of the United States.

•

Sun Purchases Firm

Sun Chemical Corp. has announced the purchase of Coating Materials Laboratories, manufacturers of industrial coatings and finishes.

The new company, which grossed more than $1,000,000 in sales last year, will be operated as an autonomous division in Sun's paints and finishes group.

Dr. H. A. De Phillips, president and general manager of the Coating Materials Laboratories, and his entire staff, will continue in the same capacity under the new management.

Representative Named

Appointment of two manufacturer's sales representatives has been announced by the Holland Color & Chemical Co., a subsidiary of Chemetron Corp.

They are American Mineral Spirits Co. of Murray Hill, N. J., and the D. M. Smith Co. of Seattle, Wash.

The firm's will handle distribution of the company's complete line of dry, flushed, and water-dispersible colors to the paint industry.

•

Velsicol Opens New Office

The industrial chemicals division of Velsicol Chemical Corp. has established a New England office at 780 Beacon St., Boston, Mass.

Harold Freedman, who has been representing the company in that area, will be in charge of the new office.

In addition to selling the firm's chemical products, Mr. Freedman will provide technical service to customers.

•

Sales Territory Formed

A new south Florida sales territory has been formed by Reichhold Chemicals, Inc.

Ralph L. Johnson will manage the new territory from offices located at 4471 N. W. 36th St., Miami Springs, Fla.

thoroughly wet pigment particles. This is accomplished by adding the amount of pigment necessary for final batching to half of the vehicle to be used. This pre-mix can be ball-milled in a jar mill with porcelain balls for 24-48 hours or given 3-5 passes through a 3-roll mill. This pigment concentrate is blended off with remainder of vehicle.

A typical air-drying high temperature (Red) enamel utilizing R-64 silicone resin and a triazine alkyd is presented in Table III. Results of various performance tests of paint based on R-64 silicone blends are found in Table IV.

Pts. by Wt.	Ingredient	Manufacturer
14.0	Union Carbide R-64 silicone resin	Silicones Div., UCC
66.6	"Uformite" M-311 50% solids triazine alkyd	Rohm & Haas Co.
8.3	"Ferro" F-5893 cadmium selenide	Ferro Corp.
11.1	Toluene	

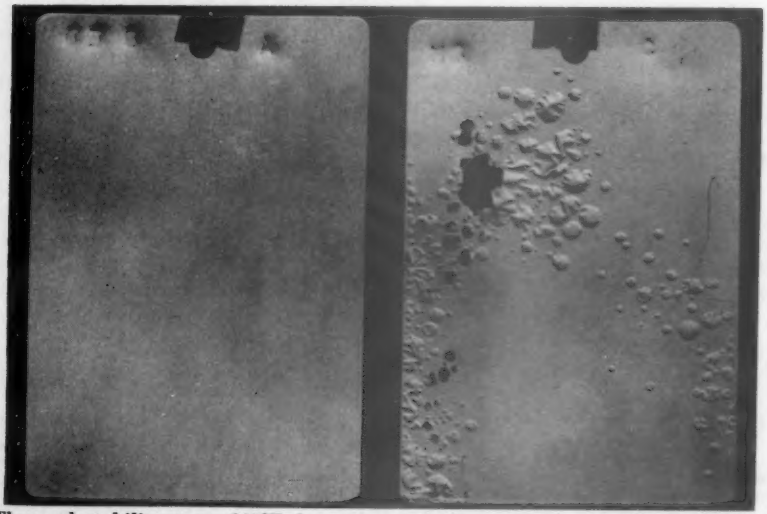
This formulation will air-dry at room-temperature in 15 minutes; cure of 1-2 hours at 300°F. will develop optimum corrosion resistance.

Table III. Air-drying red high-temperature enamel (50% non-volatile).

	Formulation As In SF-1092				
Test	**A**	**B**	**C**	**D**	**E**
1. Cycles at 1050°F. (MIL-P-14276)	30	30			
2. 500 hours at 750°F.	passed	passed			
3. Thermal Stability, 1200°F. max. (MIL-P-20087A)	passed	passed			
4. Salt Spray test (MIL-P-14276)	passed	passed			
5. Salt Spray test (MIL-P-20087A)	passed	passed			
6. Salt Spray to Failure (TT-P-141b)					
Cure					
Air Dry	350 hrs.	480 hrs.	400 hrs.	375 hrs.	400 hrs.
1 hr. at 200°C.	430	420	450	440	450
500 hrs. at 750°F.	420	420			
16 cycles at 1050°F.	280	420			
7. Appearance after 6 mo. weathering					
Cure					
Air Dry	discolored	passed			
1 hr. at 200°C.	passed	passed			
500 hrs. at 750°F.	passed	passed			
16 cycles at 1050°F.	passed	passed			

A — Moderate Baking Heat Resistant Aluminum Paint
B — Air Dry Heat Resistant Aluminum Paint
C — Air Dry Red High Temperature Enamel
D — Air Dry Black High Temperature Enamel
E — Air Dry White High Temperature Silicone-Acrylic Enamel
A-D are based on silicone-alkyd vehicle

Table IV. Heat and salt-spray properties of various paints based on silicone blends.

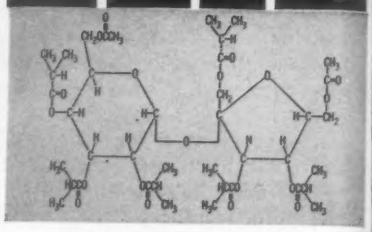


Thermal stability test: 100°F. heat rise each day starting at 400°F. to 1200°F. (MIL-P-20087A heat test). Panel, left: 20% R-64 silicone/80% short oil non-oxidizing alkyd. Air-drying aluminum paint. Heat-aged to 1200 F. Panel, right: Same formulation without silicone. Heat-aged to 700 F.

Eastman Announces

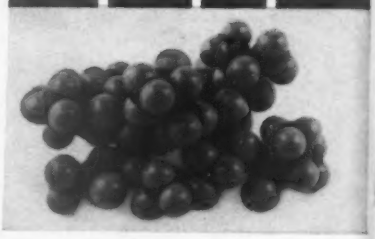
This is the formula for

S A I B



This is the structure of

S A I B



This is how Eastman sells

S A I B

100% SAIB — SAIB

90% SAIB IN ETHYL ALCOHOL — SAIB-90

For more information see opposite page

SUCROSE ACETATE ISOBUTYRATE

Unusually high solids content lacquers now possible with SAIB, new Eastman resin extender

Here is a new chemical product, Sucrose Acetate Isobutyrate (SAIB), so unlike any known product that its performance characteristics are difficult to classify. Generally, however, they lie between those of a plasticizer and a resin.

Heavy, Compact Molecule

SAIB is made by esterification of sucrose with acetic anhydride and isobutyric anhydride. The result is a clear, extremely viscous liquid of high molecular weight (847). In fact, SAIB is believed to be the heaviest monomeric organic molecule available on a commercial scale. Despite its high molecular weight, SAIB has a singularly compact molecular structure.

Figure 1

Good Permanence

This molecular compactness provides SAIB with outstanding thermal and hydrolysis stability. For example, after six days at 350°F, SAIB shows a change in Gardner color from 3 to only 10. Hydrolysis, after refluxing in water for 4 days, amounts to less than 0.35%.

Viscous, Soluble, Compatible

SAIB is so viscous at room temperature (100,000 cps at 30°C), its characteristics approach those of a semi-solid. Viscosity changes rapidly with temperature, however, dropping to 90 cps at 100°C. The extreme solubility of SAIB is indicated by the low viscosity (750 cps at room temperature) of a solution of 90 parts SAIB in 10 parts of ethyl alcohol. *(See Figure 1)* It is in this 90% SAIB/10% ethyl alcohol solution, as well as in the 100% concentrate, that Eastman markets SAIB. In addition to its good solubility, SAIB is compatible with a broad range of resins, plasticizers, oils and waxes.

High Solids Lacquers

SAIB has been evaluated in wood lacquers, paper coatings, cloth coatings, metal lacquers and plastic lacquers. In such formulations, its low solution viscosity permits higher non-volatile content without exceeding application viscosities. For example, the solids content of a lacquer system based on ½ sec. RS nitrocellulose can be increased from 20 to 33% by replacing half the nitrocellulose with SAIB, with no increase in viscosity. Thus, greater coverage per gallon of lacquer can be achieved with reduced solvent requirements.

SAIB is unique in its ability to extend lacquer formulations with no loss of film hardness. *(See Figure 2)* Nitrocellulose films can be modified with up to 50% SAIB without decreasing film hardness, with maximum hardness occurring at 25% modification. Castor oil-modified films, on the other hand, do not change appreciably in hardness up to 25% plasticizer content and decrease sharply beyond this point. Dibutyl phthalate causes an immediate, rapid drop in Sward hardness.

Sward Hardness of Plasticized Films of RS ½ sec. Nitrocellulose

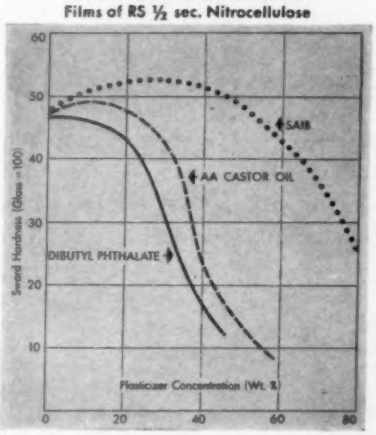


Figure 2

A newly-published bulletin on SAIB, containing physical properties and typical solvent coating formulations, is available. For your copy and a sample of SAIB write to Chemical Sales Development Department, Chemicals Division, Eastman Chemical Products, Inc., Kingsport, Tennessee.

SAIB

SUCROSE ACETATE ISOBUTYRATE

Eastman CHEMICAL PRODUCTS, INC., KINGSPORT, TENNESSEE, subsidiary of Eastman Kodak Company

SAFFLOWER OIL

Keeps Pace With Growing Demand!

New plantings in the Great Plains and in Central California mean greater stocks than ever before. But new demand for Safflower Oil is also greater than ever before. Better see that your supply is assured. Ask your PVO man the advantages of a long-term contract.

- Steady Supply
- Steady Price
- Steady Quality

PACIFIC VEGETABLE OIL CORP.
62 Townsend Street, San Francisco 7, California

1 ATLANTA, GEORGIA
G. R. Nottingham Co.

2 BOSTON, MASSACHUSETTS
R. B. Huber, Sales Engineer

3 CHICAGO, ILLINOIS
Daniel G. Hereley Co.

4 CLEVELAND, OHIO
Donald McKay Smith Company

5 DALLAS, TEXAS
W. W. Richerson Company

6 DETROIT, MICHIGAN
George E. Moser & Son, Inc.

7 HOUSTON, TEXAS
Texas Solvents & Chemicals Co.

8 KANSAS CITY, MISSOURI
Ack Sales Company

9 LOS ANGELES, CALIFORNIA
Pacific Vegetable Oil Corp.

10 LOUISVILLE, KENTUCKY
The Argus Co.

11 MILWAUKEE, WISCONSIN
J. W. Copps

12 MINNEAPOLIS, MINNESOTA
Horton-Earl Co.

13 MONTREAL, CANADA
B. & S. H. Thompson & Company, Ltd.

14 NEW YORK, NEW YORK
Pacific Vegetable Oil Corp.

15 PHILADELPHIA, PENNSYLVANIA
Baker Industrial Oils Co.

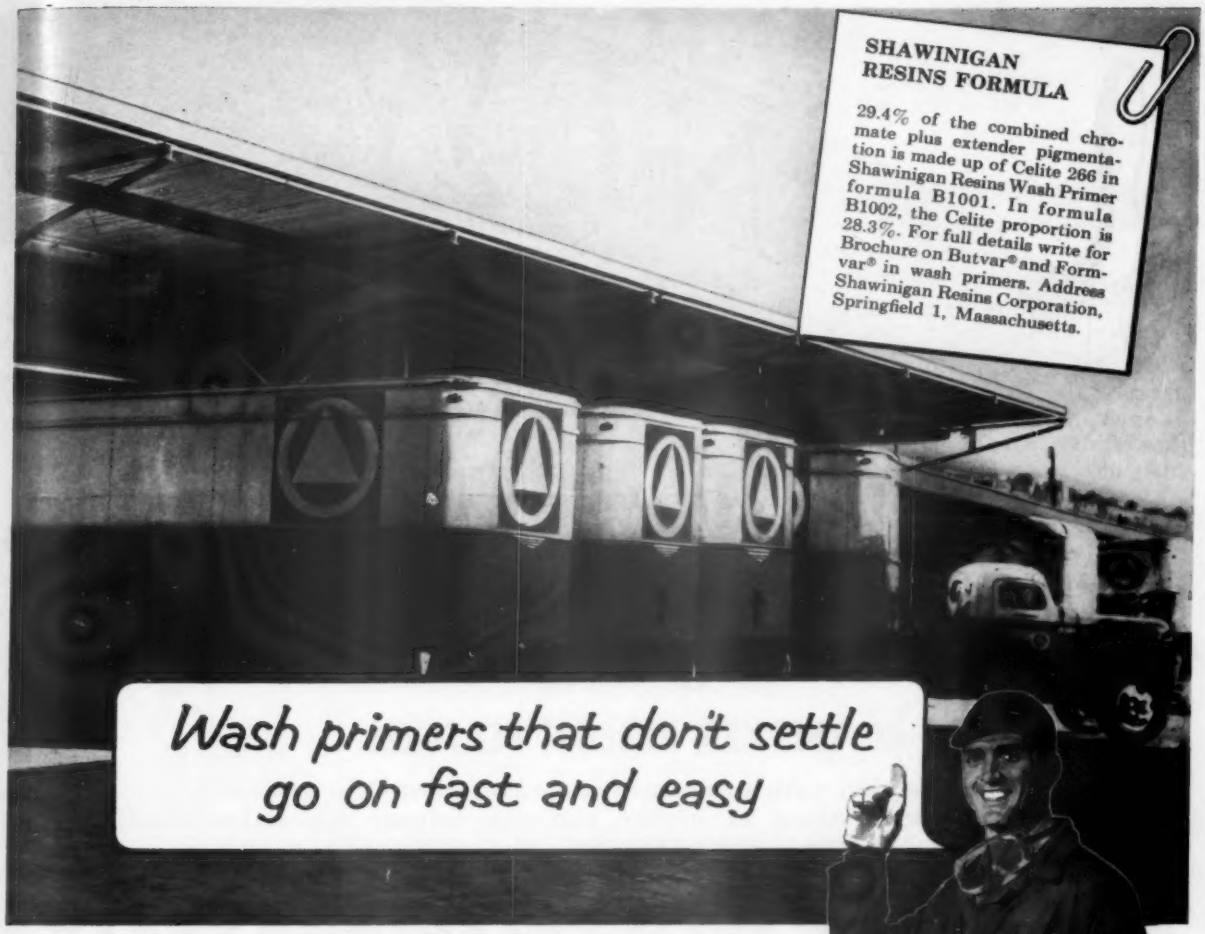
16 PORTLAND, OREGON
W. Ronald Benson, Inc.

17 SAN FRANCISCO, CALIFORNIA
Pacific Vegetable Oil Corp.

18 SEATTLE, WASHINGTON
W. Ronald Benson, Inc.

19 ST. LOUIS, MISSOURI
Ivan T. Bauman Co.

20 TORONTO, CANADA
B. & S. H. Thompson & Company, Ltd.


SHAWINIGAN
RESINS FORMULA
29.4% of the combined chromate plus extender pigmentation is made up of Celite 266 in Shawinigan Resins Wash Primer formula B1001. In formula B1002, the Celite proportion is 28.3%. For full details write for Brochure on Butvar® and Formvar® in wash primers. Address Shawinigan Resins Corporation, Springfield 1, Massachusetts.
Wash primers that don't settle go on fast and easy

To assure a soft dispersible cake Shawinigan's formula B1001 calls for Celite diatomite

IN polyvinyl butyral wash primers, Celite's* high bulking action and unique particle structure help control hard packing to assure easy application, stability and good performance. Being inert chemically, Celite also provides non-reactivity and compatibility with wash primer pigments. Irregular microscopic Celite particles also promote adhesion of top coats when they are present in primer formulations.

Find out how Celite helps combat hard pigment settling in wash primers. Write for further information to Johns-Manville, Box 14, New York 16, N.Y. In Canada, Port Credit, Ontario.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

JM PRODUCTS Johns-Manville CELITE Diatomite Pigments

ASBESTINE 325

64 YEARS of production have paid off for International Talc Co. and its customers. As the world's largest producer of magnesium silicate, International Talc Co. announces the availability of their newest member to the family.... Asbestine - 325

★ THIS NEW PRODUCT FEATURES

Good dispersion with minimum use of oil needed in grinding.... enables formulating at higher pigment volume concentrations. Thereby....

REDUCING RAW MATERIAL COSTS

without affecting performance of storage characteristics.

Also available in other grades. . . .featuring these advantages

- **1. Available in low, medium and high oil absorption**
- **2. Pure white — suitable for white or colored paints**
- **3. Acicular structure affords good suspension**
- **4. Mixes readily in all paint vehicles**
- **5. Contributes to greater durability in exterior paints**
- **6. Excellent flatting agent for flat or semigloss coatings**
- **7. Uniformly low moisture content (less than .5% loss at 212°F.)**
- **8. Bulking value 4.2 gallons per 100 lbs.**
- **9. Packed in 50 lb. paper sacks for your convenience**

PRODUCT OF

INTERNATIONAL TALC COMPANY, INC.

WORLD'S LARGEST PRODUCERS OF TALC

ESTABLISHED 1893

90 WEST ST., NEW YORK, N. Y.

INTERNATIONAL TALC CO., INC.
90 West St., New York 6, N. Y.

Please send FREE Sample and Technical Data on ASBESTINE 325.

Name.....
Company.....
Street.....
City.....State.....

SEND COUPON FOR FREE SAMPLE AND TECHNICAL DATA ABOUT

ASBESTINE 325

S. W. Tuttle, Vice-President

NEW MATERIALS & EQUIPMENT

A MONTHLY MARKET SURVEY

This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.

CHARLES ROSS

CHANGEABLE CAN MIXER

Double Planetary Stirring

Changeable can mixers incorporating double planetary stirrer action.

Also features vacuum tight covers. Mixers can be provided with jackets on cans for heating and cooling material during mixing when required.

Driven by variable speed motor drive and are obtainable in various sizes from the one-gallon laboratory size up to 150-gallon working capacity size.

Charles Ross & Son Co., Dept. PVP, 148-156 Classon Ave., Brooklyn 5, N.Y.

PINE OIL REPLACEMENT

Variety of Uses

Chemical formulation, Hodag PX-1, to be used as a replacement for pine oil.

Proprietary combination of alcohols, hydrocarbons, and surface-active chemicals. Used as an anti-foam, leveling agent, and solvent in a broad range of applications.

Used as a replacement for pine oil in most formulations and processes where "preservative" properties are not required.

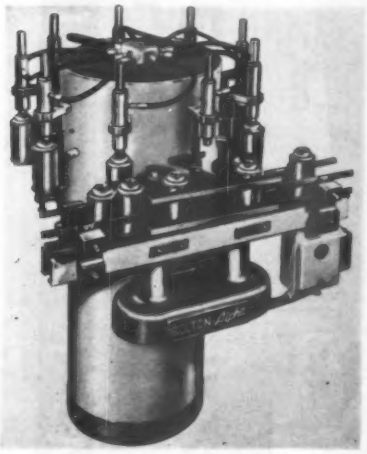
Hodag Chemical Corp., Dept. PVP, 7247 N. Central Park, Chicago 45, Ill.

PRESSURE FILLER

For Aerosol-Type Containers

No. 1651 line of high speed production line rotary pressure fillers that fill aerosol-type containers with several different types of liquid propellants.

Filler features precision pressure filling heads that will handle butane and propane straight hydrocarbon-type propellants as well as the usual fluorinated hydrocarbon types with complete safety.



ARTHUR COLTON

Made in standard models which will fill containers with propellant following product filling, dispenser valve insertion, and valve crimping operations.

Production rates of up to 200 cans per minute. Adjustable fill capacities of up to 300 grams of propellant.

Fillers occupy a floor space approximately 30″ x 40″ and are about 60″ high.

Arthur Colton Co., Dept. PVP, 3400 East Lafayette, Detroit 7, Mich.

MEASURING GRADUATE

Tough, Lightweight Plastic

Clear, glass-like plastic graduate made of tough, lightweight plastic.

Unbreakable under normal usage. Will not craze and cloud. Surface is smooth, hard, easy to clean, and will not slip when wet. Liquids will not permeate it.

Markings in both ounces and metric measure. Conical in shape with large, non-tip, non-roll octagonal base.

Available in 4, 8, 16, and 32 ounce sizes.

Needs Corp., Division 237, Dept. PVP, 255 W. Euclid Ave., Jackson, Mich.

GAS MIXER

Dual-Port Mixing Valve

Proportion-Aire, available in standard sizes with rated maximum capacities from 500 cfh to 75,000 cfh at pressures up to 100 psi.

For mixing two or more gases at a preset ratio despite variations in mixture pressure and total flow.

Consists of a dual port mixing valve and either an integral vane-type positive displacement pump or centrifugal compressor. Valve so designed that the total port area varies in response to changes

SELAS

NEW MATERIALS — EQUIPMENT

in pressure-drop across the valve, but the ratio of individual port areas, once set, remains constant.

Mixture ratios may be held to within 2% on manual setting and to within 0.2% with appropriate automatic control, at varying demand from 10% to 100% of rated capacity.

Proportion-Aire cannot be used with halogens or other highly corrosive gases.

Selas Corp. of America, Dept. PVP, Dresher, Pa.

UNIVERSAL VEHICLE
For Tinting Paints

Uneek, a universal vehicle for tinting colors. Claimed that dry colors can be dispersed very easily in Uneek to yield a paste which is outstanding for tinting house paints, alkyds, synthetics, and latex paints.

Pastes made with Uneek, when used for tinting paints, said to show excellent stability; no floating or flooding, easy handling, no skinning with no effect on dry, and rapid and thorough development of color in paint systems.

Farnow, Inc., Dept. PVP, 4-83 48th Ave., Long Island City 1, N. Y.

TABER

SCRATCH TESTER
Fast & Accurate Readings

Shear/Scratch testing instrument is a device for testing the surface quality of organic materials and plastic coated surfaces to resist digs, scratches, scrapes, engravings, and similar physical damage not classed as normal wear.

Fast and accurate test readings are claimed to be taken directly from a finely balanced scale beam, calibrated in grams, to which are attached either a precision ground contour shear tool or a conical or cube point diamond tool.

R. L. Oldenberg, Section 233, Taber Instrument Corp., Dept. PVP, N. Tonawanda, N.Y.

VACUUM DRYER
Internal Volume of 500 cu. ft.

Large capacity Rota-Cone Vacuum Dryers. Two units available have inside diameter of 10′ and an internal volume of 500 cu. ft. Each dryer weighs more than 13 tons and has been designed to handle a batch of 12,500 lbs. of material at one time.

Completely jacketed, each dryer is heated by means of a hot fluid introduced into the jacket by a 4″ diameter syphon type rotary union.

Revolves in heavy duty roller bearings, mounted on steel supporting stands which provide swing clearance under the discharge valve.

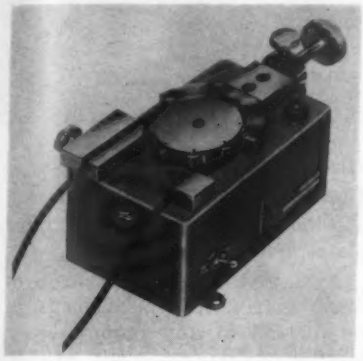
Driven by a 40 HP gearmotor, and a machine-cut guarded gear and pinion.

Capable of removing up to one-ton of moisture per hour from the batch, and vacuums as high as 10

NATIONWIDE
Service Network Puts
ST. JOE ZnO . . . "At Your Doorstep"
33 DISTRIBUTORS
25 WAREHOUSES
Need lead-free zinc oxides in a hurry? Listed above are the telephone numbers of our distributors. Most of them carry large stocks of ST. JOE lead-free ZINC OXIDES in their warehouses. On technical problems, their broad experience plus St. Joe's service back of them can be helpful. For supplies in any quantity, or technical help of any kind, they are at your service — and within reach of your telephone.
ST. JOSEPH LEAD COMPANY
250 Park Avenue, New York 17, New York
Plant & Laboratory: Monaca (Josephtown), Pennsylvania

m.m. of mercury absolute pressure can be obtained. Temperature of the batch can be measured at all times.

Paul O. Abbé, Dept. PVP, 239 Center Ave., Little Falls, N. J.



NEW BRUNSWICK

METERING PUMP

Transfer Liquids & Gases

A series of continuous-duty metering pumps that transfer liquids and gases through plastic or rubber tubing at exceptionally slow rates.

Adaptable for wide variety of applications, any one of the model PA Peristaltic Pumps may be used as a metering device to move materials into reaction vessels, or as an auxiliary pumping unit in conjunction with other equipment.

All model PA Peristaltic Pumps accommodate tubing of maximum outside diameter of ¼". Standard model operates at rotor speed of 56 rpm.

Weighs 8½ pounds. Pump can be stood up on end, can lie flat, or can be hung or bolted on wall or panel.

New Brunswick Scientific Co., Dept. PVP, P.O. Box 606, New Brunswick, N.J.

POLYURETHANE SOLVENTS

For Resin Coatings

Cellosolve Acetate (99%) and Ethyl Acetate (99.5%) are newly developed grades of these esters which are said to fulfill the exacting solvent requirements for polyurethane resin coatings.

Excellent stability claimed.

Union Carbide Chemicals Co., Dept. PVP, 30 E. 42nd St., New York 17, N.Y.

LEAD CHROMATE PIGMENT

For Anti-Corrosive Paints

Permox 143, basic lead silico chromate pigment, specifically designed for use in formulating anti-corrosive paints.

Particles consist of silica core enveloped in coating or shell of basic lead chromate.

Pigment said to have excellent tint retention and chalk resistance; and claimed to be ideal for all three coats—primary, intermediate, and finish coats.

Eagle-Picher Co., Dept. PVP, 900 American Building, Cincinnati 1, Ohio.

ULTRAVIOLET ABSORBER

Protects Against Damaging

UV 9 Ultraviolet Absorber protects many products from discoloring, fading, brittling, and other damage caused by exposure to the invisible ultraviolet portion of natural or fluorescent light.

Provides ultraviolet-light stability to materials by absorbing or soaking up harmful ultraviolet light and transforming it into harmless radiation.

American Cyanamid Co., Organic Chemicals Division, Dept. PVP, 30 Rockefeller Plaza, New York 20, N.Y.

Everybody talks about the Weather

But now you *can* do something about it, as it affects your product, with the Atlas Weather-Ometer.®

Weathering durability and color fastness is a major problem in developing a new paint product. Reliable answers to a new product's resistance to weathering can be obtained with speed and accuracy in the Atlas Weather-Ometer. Test programs can be exactly duplicated at any time to give accurate comparative data of various formulas.

For quality control in production—the Weather-Ometer is useful in maintaining the quality standard of the product, by checking each batch run for any deviation from the established weathering and light fastness standards.

A positive control of specimen temperatures greatly increases the accuracy of test results. Automatic humidity control up to dew point is available as optional equipment.

Both horizontal and vertical testing is available. Shallow containers are used for semi-liquid material and vertical panels for solids.

Write for complete Weather-Ometer catalog.

All automatic controls including complete voltage controls are located on the front panel above the test chamber door. Source of light is two Atlas enclosed violet carbon arcs.

Sales representatives in principal cities throughout the world.

ATLAS ELECTRIC DEVICES CO.

4114 N. Ravenswood Ave., Chicago 13, Illinois U.S.A.

WEATHER-OMETERS® • FADE-OMETERS® • LAUNDER-OMETERS®

NEW MATERIALS — EQUIPMENT

CLAMP ATTACHMENT
Non- & Palletized Loads

Both palletized and non-palletized loads, as well as those on skids and in bins, said to be handled easily and efficiently by a clamping attachment called the Master Universal Clamp.

Multi-purpose attachment available on all of the firm's electric fork lift trucks.

Has a clamping range from 18 to 46 inches or 23 to 60 inches, depending on the materials being handled.

Controls for operating can be firmly held in any position of closure and are located at the driving position.

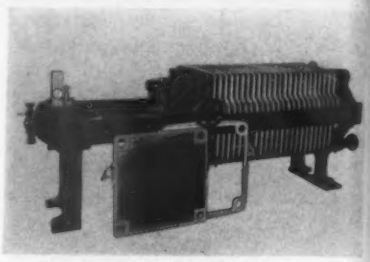
Lewis-Shepard Products, Inc., Dept. R8-14, Dept. PVP, 125 Walnut St., Watertown 72, Mass.

LACQUER ADDITIVE
Eliminates Fish-Eyes

Additive for all lacquers and enamels eliminates fish-eyes and cratering in touch-up, panel repair, and complete refinish jobs.

Called Fish Eye Eliminator, it is a crystal clear material, packed in capsules. Each capsule contains a measured quantity sufficient for one pint of thinned paint.

Finishes Division, E.I. Du Pont de Nemours & Co., Dept. PVP, Wilmington, Del.



SHRIVER

FILTER PLATES
Fiberglas-Reinforced Polyester

Filter press with polyester filter plates, now available.

New type of plate is made of fiberglas-reinforced polyester. Can be molded in any required size. Remains dimensionally stable throughout a wide range of temperatures.

Plate is said to be as strong as one made of aluminum, weighs less than one-third that of cast iron, and costs one-third of stainless steel.

T. Shriver & Co., Inc. Dept. PVP, 808 Hamilton St., Harrison, N. J.

PACKAGE CLIPPER
For Sealing Containers

Clip-Top Packer, Model M, closes any average shipping case in a few seconds time.

Seals filled containers from the outside and "sets-up" flat cartons, ready to be filled.

Stainless steel negator spring feed assures smooth staple flow by exerting a constant tension at all times. One piece construction.

Container Stapling Corp., Dept. PVP, 308 N. Park Ave., P.O. Box 247, Herrin, Ill.

SOY DISPERSING AGENT
For Water-Based Paints

Soy dispersing agent designed to perfect water-based paints.

The product, trademarked "DispersaGen" said to disperse pigments exceptionally well and minimizes tendency of suspensions to separate.

It is non-ionic, pale colored, low in viscosity and easy to handle.

General Mills, Inc., Dept. PVP, Kankakee, Ill.

Paint manufacturers who know standardize on

METALLIC SOAPS

Chances are you are using Metasap Metallic Soaps in your paint products already. If not, you will find it profitable to do so.

Metasap is the oldest and largest producer of metallic soaps in the country . . . with a research staff attuned to the paint manufacturers' constantly changing needs . . . with the equipment necessary to produce custom-made formulations to meet every special need.

And remember, our skill with metallic soaps is complemented by our nation-wide distribution facilities. Whatever your needs, you will fill them best—fill them fast—through Metasap.

Write us for full information. Our Technical Service Department will gladly make recommendations based upon your specific requests. Metasap Chemical Company, Harrison, N.J.

METASAP CHEMICAL COMPANY
METALLIC SOAPS FOR THE PAINT INDUSTRY
A subsidiary of NOPCO

Harrison, N.J. • Richmond, Calif. • Cedartown, Ga. • Boston, Mass. • Chicago, Ill. • London, Canada

Continental gives you the MOST ADVANCED paint packaging protection!

6 to 9 months longer shelf life for PVA and latex base paints

Here's advanced paint packaging protection. Continental's exclusive Outward Curl can prevents corrosion because the raw metal edge of the friction ring is *outside* the can where paint can't touch it. PVA and latex base paints get 6 to 9 months longer shelf life! Available in quart and gallon sizes. A big sales-appealing feature for your paints.

50% greater protection against oxidation and skin formation

Tripletite can lids have three guard points instead of two. Your paints get 50% greater protection against oxidation. If air seeps through the first seal, the second or third is sure to stop it. Continental offers all standard sizes of paint cans from 4 ounce to 1 gallon, all with Tripletite protection. Call Continental for the most advanced paint packaging protection.

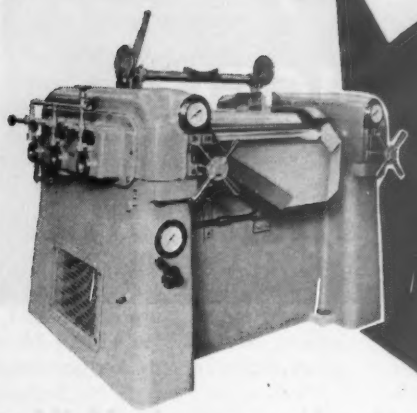
CONTINENTAL CAN COMPANY

Eastern Division: 100 East 42nd Street, New York 17
Central Division: 135 South La Salle Street, Chicago 3
Pacific Division: Russ Building, San Francisco 4
Canadian Division: 5595 Pare Street, Montreal, Que.

Call Continental for positive packaging protection . . . famous Continental service.

THESE MACHINES IN YOUR COMPETITOR'S PLANT

—can make things tough for you



Lehmann Model 662-V (also 661-V and 663-V) Sight-O-Matic Three Roll Mill. Also available with selective Float-O-Matic feature.

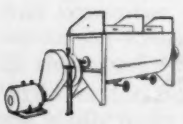
Lehmann Model 631-V (also 632-V) Sight-O-Matic Three Roll Mill.

The LEHMANN 631-V VERTICAL and the 662-V HORIZONTAL THREE ROLL MILLS with SIGHT-O-MATIC® CONTROLS definitely improve quality, increase output, and reduce costs wherever they are installed. If your competitor has this equipment, and you do not, you are, in effect, yielding him a strong competitive advantage.

Current buyers' markets are becoming more selective every day. The manufacturer who uses less than the best production equipment can be sure of one thing—the money he "saves" by not buying modern machinery he will lose many times over in higher operating costs and reduced business.

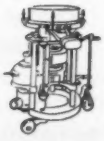
We suggest you send for complete information regarding Lehmann Roller Mills and other up-to-date milling equipment—learn what savings in time and money can be yours by installing Lehmann units in your plant to bring your operating costs down to rock bottom.

Lehmann would be pleased to offer milling research service on samples of your formulations, without obligation, and Certified Factory Reconditioning Service on your present equipment.



Lehmann's extensive line of equipment consists of: Vertical and Horizontal Roller Mills • Heavy-Duty Twin Paste Mixers • Sieving and Screening Machines.

Send for further information on any or all of the machines listed above.



LEHMANN®

J. M. LEHMANN COMPANY, Inc.

COAST-TO-COAST SERVICE

Moore Dry Dock Company, Oakland, California

Lammert & Mann Co., Chicago 12, Illinois

J. M. Lehmann Co., Inc., Lyndhurst, New Jersey

TALL OIL TALK FROM Arizona

CHEMICAL COMPANY

World's largest producer of products based on Tall Oil

TREES BY THE GALLON

WHEN YOU MAKE PAPER FROM PINE YOU GET "LIQUOR" TOO. AND FROM THE LIQUOR WE MAKE TALL OIL. ARIZONA CHEMICAL COMPANY USES "TREES BY THE GALLON" TO ASSURE YOU A STEADY, RELIABLE SUPPLY OF ECONOMICAL ACINTOL TALL OIL PRODUCTS.

NEW WRINKLE REMOVER

PAINTS MADE WITH ACINTOL* FA-2 TALL OIL FATTY ACIDS CAN BE SPRAYED HOT. THEY DRY SMOOTHLY EVEN IN VERY HEAVY FILMS, AND WITHOUT WRINKLING! WEATHERING · DURABILITY IS VASTLY IMPROVED, TOO.

J. S. MAHNKEN, BERKELY, CAL.

UP IN THE AIR ON WEATHERING?

BRIDGE PAINTS CONTAINING ACINTOL FA-2 TALL OIL FATTY ACIDS SOLVE EXPOSURE PROBLEMS WHILE KEEPING COSTS DOWN TO EARTH.

J. P. HAUGHNEY, CHICAGO, ILL.

RAINBOW VARNISH?

THIS MAY BE JUST AROUND THE CORNER. BASIC DYES (SALTS OF COLORED BASES CONTAINING AMINO OR SUBSTITUTED AMINO GROUPS) MADE FROM TALL OIL FATTY ACIDS ARE VERY EFFECTIVELY IMPARTING COLOR TO VARNISHES AND SIMILAR CLEAR, PROTECTIVE FINISHES.

J. A. YOUNG, WILKES BARRE, PA.

WIN A BARREL OF TALL OIL—It's easy . . . just send us your idea for a new use of Tall Oil Products. If it's used in one of our ads, you will be the proud owner of a drum of ACINTOL—or its equivalent in cash. Win, lose or draw—you get a prize just for entering. So do it NOW. Send your Tall Oil Tale to.

Arizona Chemical Company

(Incorporated)

*Reg. U. S. Patent Office

30 Rockefeller Plaza, New York 20, N. Y.

ACINTOL D and ACINTOL DLR Special Distilled Tall Oil · ACINTOL FA-1 and FA-2 Fatty Acids · ACINTOL P Tall Oil Pitch · ACINTENE* Terpenes

DISTRIBUTORS: A. J. Lynch & Co., Los Angeles, Alameda · Charles Albert Smith Ltd., Toronto, Montreal, Vancouver · The Nottingham Co., Atlanta · T. G. Cooper & Co., Inc., Philadelphia · Parac Oil and Chemical Co., Chicago · George E. Moser & Son, Inc., Detroit · Donald McKay Smith Co., Cleveland · Thompson-Hayward Chemical Co., Houston and New Orleans · Van Waters & Rogers, Inc., Dallas · N. S. Wilson & Sons, Boston · M. J. Daly Company, Ludlow, Ky. · Great Western Chemical Co., Seattle and Portland, Oregon · Welch, Holme & Clark Co., Inc., New York.

Announcing... **THE NEWEST ADDITION TO A FAMILY OF QUALITY RESINS**

MARBON 11953 RESIN

for COUNTLESS COATING APPLICATIONS

Marbon's versatile 11953 resin is particularly suited for interior and exterior finishes . . . for printing inks, low cost concrete paints, traffic and nonskid paints . . . as a corrosion resistant primer. In addition, it may be used as a sealer for plaster, enamel undercoater, brushing lacquer, for clear waterproofing, etc. What problem can it help *you* solve?

Write Today For Latest Technical Information

SUITABLE FOR LOWER ODOR LOWER COST ALIPHATIC SOLVENTS

Marbon's 11953 resin dissolves readily in aliphatic solvents, (KB 35-45). Resistant to alkalies, chemicals, salt water, abrasion, fumes and mildew, 11953 resin is washable . . . forms a clear, colorless film of unusual strength and hardness. Versatile too, Marbon's 11953 resin can be used in a wide variety of coating applications, and lends itself to brushing, rolling, spraying or dipping.

PACESETTER IN

Marbon CHEMICAL

SYNTHETIC RESINS

Division of BORG WARNER • Gary, Indiana

also represented by:

WEST COAST: Harwick Standard Chemical Co., Los Angeles, Cal.
CANADA: Dillons Chemical Co. Ltd., Montreal & Toronto
EXPORT: British Anchor Chemical Corp., New York

BW ® Marbon

PERSONNEL CHANGES

DEWEY & ALMY

Karl L. Rohde, Jr. has been appointed sales representative of organic chemicals for the Southern California area, it has been announced.

K. L. Rohde, Jr.

Mr. Rohde's headquarters will be located in Los Angeles.

A 1947 chemistry graduate of Harvard College, Mr. Rohde has been with the firm for six months at the Cambridge, Mass. office. He was formerly with the sales staff of the G. D. Searle Co.

PITTSBURGH COKE & CHEMICAL

Walter H. Daub, Jr. has been promoted to an assignment as sales development representative of the company's industrial chemical division and **Dr. Salvatore Piccione** has joined the research and development department, it has been announced.

Mr. Daub will be transferred from the Philadelphia territory to his new post. He will be succeeded in his present sales assignment by **Donald L. McCuen.**

Mr. Daub joined the firm in 1951, having been previously associated with Mellon Institute and the Atlas Powder Co.

He is a graduate of Princeton University.

A physical chemist, Dr. Piccione will be assigned to the analytical and physical research section of the R&D laboratory.

Prior to joining the firm, Dr. Piccione served as a research chemist in Canada with both the General Electric Corp. Ltd., and Aluminum, Ltd.

ENJAY

Gavin A. Taylor has become manager of export sales—Europe, it has been announced.

In his new post, Mr. Taylor will spend the next six to eight months in Western Europe and North Africa.

Mr. Taylor joined the company in 1942. Between 1945 and 1952, he supervised foreign sales activities of the firm's chemicals, solvents and oil additives. In 1956, he was appointed assistant manager of the butyl division.

Mr. Taylor is a graduate of Tufts College.

W. P. FULLER

E. R. MacMillan has been appointed to the newly created position of assistant to the president, it has been announced.

Mr. MacMillan, for the past three years, has been in Chicago as vice president of Solo Cup Co. Previously, he was associated with the firm of Haskins & Sells in management advisory services.

VULCAN STEEL CONTAINER

Leo T. Ryan has been appointed general sales manager with headquarters in Birmingham, it has been announced.

Mr. Ryan attended the University of Alabama, receiving his degree in commerce and business administration.

IMPERIAL PAPER & COLOR

John D. Fay has been appointed sales representative for the pigment color division, it has been announced.

J. D. Fay

Mr. Fay's territory will cover the metropolitan New York area.

He attended Champlain College, Plattsburgh, N. Y., after serving two years in the U. S. Air Force in pilot training.

Prior to joining the firm, Mr. Fay was engaged in his own business as general contractor for the past seven years.

A SKILLED HAND IN CHEMISTRY . . . AT WORK FOR YOU

NOPCO HYONICS® Serve Latex Paint Manufacturers

More and more, leading latex paint manufacturers are learning the advantages assured by Nopco Hyonic nonionic surfactants. The Hyonic PE products are a homologous series of octyl phenol condensates. The differences in their ethylene oxide molarity give them diverse properties which are expressed in a multitude of applications

—as chemical stabilizers, to prevent coagulation caused by electrolytes, dehydration and hard water and to prevent flocculation of dispersed pigments

—as mechanical stabilizers, to prevent coagulation caused by mechanical agitation and pumping

—as freeze thaw stabilizers, to protect against damage from repeated freezing and thawing

And, more and more, leading latex paint manufacturers are learning to depend on Nopco for all paint specialties.

If you are not already a Nopco customer, you will find it to your advantage to become one. Write for a booklet fully describing Nopco's complete line of paint additives. Nopco Chemical Company, 60 Park Place, Newark 2, N.J.

NOPCO®

VITAL INGREDIENTS FOR VITAL INDUSTRIES

Plants: Harrison, N.J. • Richmond, Calif. • Cedartown, Ga. • London, Canada

NATIONAL STARCH PRODUCTS

Vincent Ciufia has been appointed sales representative for the resin division, it has been announced.

V. Ciufia

His territory will include the areas of Wisconsin, Minnesota, Indiana, western Michigan, northern Illinois, and Louisville, Ky.

In his new position, Mr. Ciufia will handle the firm's complete line of resins for the paint industry.

Mr. Ciufia will work out of the company's Chicago office.

He attended the Illinois Institute of Technology.

William Juenger has been appointed sales representative for the resin coatings division, it has also been announced.

Mr. Juenger's territory will include the states of Missouri, Iowa, Nebraska, Kansas, Oklahoma, Arkansas, southern Illinois and western Tennessee.

He will handle the company's complete line of resins for the paint industry.

He will operate out of the firm's St. Louis office.

SUN CHEMICALS

Stanford R. Horn has been made a vice president and **Alan D. Marks** has been appointed to the trade sales division, both of the A. C. Horn Companies, it has been announced.

Mr. Horn has been with the firm since 1936. He became general manager of the Pacific coast operation in 1955.

Mr. Marks' territory will be southern New Jersey and eastern Pennsylvania.

Also announced was the appointment of **Harry Cooper III** to sales manager, trade sales division, of the Horn Companies.

ARCHER-DANIELS-MIDLAND

Everett Sklarz has become eastern regional resin sales supervisor, it has been announced.

E. Sklarz

Mr. Sklarz, a technical sales representative for the firm in New York since 1948, will supervise resins sales in the territories covered by the firm's New York, Cambridge, Philadelphia, and Baltimore sales offices.

A chemical engineering graduate of Purdue University, Mr. Sklarz had been previously associated with Sherwin-Williams Co. as a chemist and with Vita-Var Corp.

T. G. Garfield, Jr. has been promoted to sales manager for linseed oil, it has also been announced.

Mr. Garfield, formerly assistant sales manager, succeeds **Charles M. Allen,** recently transferred to Kansas City, Mo., as administrative assistant in the alfalfa division.

Also announced was that **Jay C. Hjortland** will continue as sales manager of the packaged linseed oil department and will assume additional responsibilities for general linseed oil sales under Mr. Garfield.

Mr. Garfield joined the firm in 1949 as a market analyst. He holds a master's degree in marketing from the University of Iowa.

Mr. Hjortland has been sales manager for packaged linseed oil since 1956. He joined the firm in 1949 after attending North Dakota Agricultural College.

ATLAS POWDER

William C. Lytle has been elected a vice president, it has been announced.

Mr. Lytle will be in charge of the company's explosives division and assigned corporate staff activities.

Mr. Lytle joined the firm as a chemist shortly after receiving his bachelor's degree in chemistry from the University of Colorado in 1917.

He has held a variety of posts and most recently was assistant to the senior vice president.

now shipped in bags* . . .

Shipped in 25-lb. and/or 50-lb. rugged multiwall paper bags.

YOU GET THESE BENEFITS:

- More efficient . . . easier batching
- Easy handling by one man
- Easy identification for use
- Easily disposed-of empties
- Less material exposed to contamination in partially used containers

LITHOL TONERS — 25-lb. bags
DIXIE REDS — 50-lb. bags
ALL OTHER REDS—25-lb. and/or 50-lb. bags
*Still available in fiber drums

OTHER SUCO PRODUCTS AVAILABLE IN BAGS:
Iron Blue, Ultramarine Blue, Blanc Fixe

Standard Ultramarine & Color Co.

BRANCH OFFICES AND AGENTS: Standard Ultramarine & Color Co., Newark, Philadelphia, Chicago, New Orleans — Standard Ultramarine & Color Co., Ltd., Toronto and Montreal, Canada — J. C. Drouillard Co., Cleveland — Thompson-Hayward Chemical Co., Kansas City and Branches — L. E. Crossley, Boston. Also agents in other principal cities.

HUNTINGTON WEST VIRGINIA

SPENCER KELLOGG & SONS

Robert L. Terrill has been named director of research and development and elected vice president of the company and **James S. Williams** has been appointed general superintendent, it has been announced.

R. L. Terrill

J. S. Williams

Mr. Terrill has been with the firm for the past 20 years. In 1956, he assumed the duties of production superintendent serving in this capacity until his present appointment.

He is a 1936 graduate of Eastern Kentucky State College with a degree of B.S. in chemistry and mathematics.

Mr. Terrill succeeds **Dr. Malcolm M. Renfrew**, who recently resigned.

Mr. Williams entered the employ of the firm in 1937 as a chemical engineer.

Most recently, he served as staff engineer of the production division.

Mr. Williams graduated from the University of Virginia in 1937 with a degree in chemical engineering.

ALLIED CHEMICAL

Peter J. Cambourelis has become technical assistant to the director of product development, Solvay Process Division, it has been announced.

Before joining the company, Mr. Cambourelis was a sales engineer for RemCru Titanium, Inc.

He is a graduate of Massachusetts Institute of Technology and holds a B.S. degree in business and engineering administration.

UNION CARBIDE CHEMICALS

The transfer of three technical representatives was recently announced by the firm, a division of Union Carbide Corp.

The transfers are: **Paul A. Hiznay** to the Philadelphia district; **Francis R. Kean** to the Newark district; and **Charles D. Schmidt** to the Detroit district.

HEYDEN NEWPORT

Clement H. Horst has been named vice president and general manager of the international division, it has been announced.

Assistant vice president since 1957, Mr. Horst will succeed **Ernest E. Holdman,** recently retired.

Mr. Horst began his career with the organization in 1935.

ARIZONA CHEMICAL

Charles O. Myatt has been appointed technical service manager, it has been announced.

Mr. Myatt will be responsible for providing technical service and information to the firm's customers throughout the United States. He will maintain headquarters at the company's laboratory at Linden, N. J.

Formerly in technical service in the coating resin division of the American Cyanamid Co., he also served as chief of the evaluations section of the surface coatings group at Cyanamid's Stamford laboratory. Recently, he was technical director of the Atlantic Varnish & Paint Co.

Mr. Myatt is a graduate of the University of Maine.

COLUMBIAN CARBON

E. B. Brooks has been elected a vice president of the company, it has been announced.

E. B. Brooks

Mr. Brooks will be in charge of the firm's carbon black and pigment division, a post previously held by **A. Harvitt,** who is retiring.

After graduation from Dartmouth College and the Amos Tuck School of Business, Mr. Brooks joined Binney & Smith Co. He came to his present company in 1955 as general sales manager.

Multifex® MM eliminates flooding, floating, sagging in industrial enamels

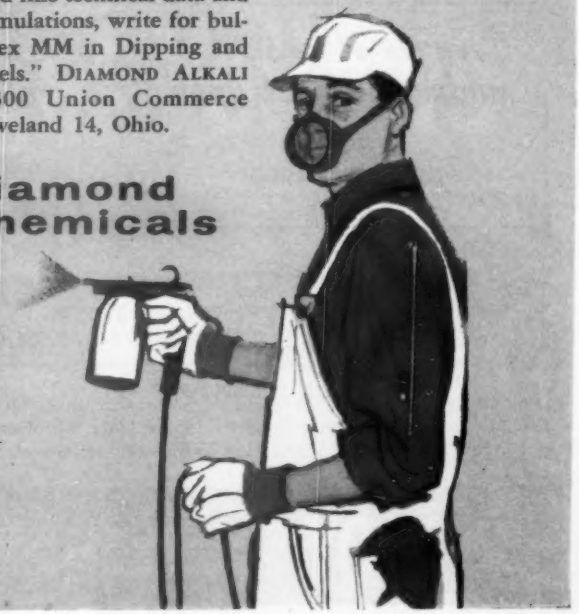
You can improve your industrial enamels and undercoats — in several ways — by formulating with Multifex MM.

For example, DIAMOND's precipitated calcium carbonate increases build and prevents pigment settling in dip, spray and tumbling applications. It eliminates flooding and floating of tints and solid colors and also stops sagging when properly formulated into enamel systems.

This economical extender pigment provides increased film hardness and smoothness. The ultra-fine particle size (.04-.06 micron) of Multifex MM improves the general pigment dispersion properties.

If you would like technical data and suggested formulations, write for bulletin, "Muitifex MM in Dipping and Utility Enamels." DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio.

Diamond Chemicals



GOODYEAR

Robert E. Workman, former manager of the chemical division of the firm's international corporation, has been appointed to the newly created post of assistant general manager of the chemical division, it has been announced.

Mr. Workman has been on a leave of absence the past year while participating in the executive development program at Massachusetts Institute of Technology. He was awarded a master of science degree for his work there.

Mr. Workman first joined the firm as a chemist in 1942. Prior to his international corporation post, he was assistant to the general manager of the chemical division.

He is a graduate of Case Institute of Technology with a B.S. degree in chemical engineering.

GEORGIA MARBLE

Al Boehmer, Jr. has been appointed sales representative for the calcium products division, it has been announced.

Mr. Boehmer will be responsible for the firm's entire line of products in the south and middle west.

Prior to this appointment, Mr. Boehmer had been plant manager of the Tower Paint Manufacturing Co. of Miami. For eight years previous to that, he was associated with the A. L. Boehmer Paint Co.

Mr. Boehmer attended Case Institute of Technology in Cleveland.

TROYKYD BODYING and PUFFING AGENT 21BA

THE PUFFING AGENT USED MORE BY MORE PAINT COMPANIES

Because it is . . .

THE MOST POWERFUL
THE MOST UNIVERSAL
THE MOST STABLE
THE MOST EFFECTIVE

PUFFING AGENT
in the coatings industry

Because it . . .

MAINTAINS ITS VISCOSITY INCREASE INDEFINITELY

Because it has minimum effect upon . . .

- **GLOSS**
- **LEVELLING**
- **FLOW**

Because it prevents . . .

- **SETTLING**
- **SAGGING**

And Because it . . .

- **IMPROVES BRUSHABILITY**
- **LOWERS RAW MATERIAL COST**

For these reasons TROYKYD 21BA has become the industry standard. Its use in YOUR formulations will assure you a better, more economical product, with fewer production problems. We welcome your inquiries.

for full information and samples write to:

TROY CHEMICAL COMPANY
338 Wilson Avenue ● Newark 5, N. J.

CROWN CORK & SEAL

The following personnel changes have been announced by the firm:

Harvey C. Tull, formerly manager of aerosol products, has been named consolidated district sales manager at Philadelphia; **W. L. Lohrfinck** has been appointed sales manager of crown and closure division sales; and **Hamilton Lowe** has become district sales manager for the Florida area, with headquarters in Orlando.

Mr. Tull has been with the company since 1936. In his new position, he will be responsible for sales of the firm's entire line in the greater Delaware Valley area.

Mr. Lohrfinck has been with the organization for the past 48 years. Most recently, Mr. Lohrfinck has been assigned as New York district sales manager.

For the past 17 years, Mr. Lowe has been active in the selling of cans for two can manufacturers.

He joined the firm early in 1958 and, in his present position, succeeds **Fred Pinkerton,** resigned.

Jack George has joined the sales staff, it has also been announced.

Mr. George, who will continue playing professional basketball with the Philadelphia club, had been previously affiliated in a sales capacity with Connelly Containers, Inc.

After completion of the company's orientation and sales training course, Mr. George will be assigned to the firm's middle Atlantic sales district.

He is a graduate of LaSalle College.

PICCO

James F. Pflum has been named manager of a new sales service engineering department.

Mr. Pflum has been assistant chief engineer of the firm since 1946, and is a graduate of the University of Dayton.

ESSO STANDARD OIL

William Naden has been elected president, it has been announced.

W. Naden

A director of the company since 1946 and executive vice president since 1955, he succeeds **Stanley C. Hope,** who plans to retire.

Mr. Naden joined the firm in 1927 as a chemist. In 1934, he became general superintendent of the Everett plant and nine years later was appointed to the same position in the Baltimore refinery.

During wartime, Mr. Naden served as director of refining for District I of the Petroleum Administration for War.

AMERICAN-MARIETTA

W. B. Chambers has been appointed general manager of the firm's Sewall Paint & Varnish Division, it has been announced.

W. B. Chambers

Mr. Chambers joined the company as general sales manager earlier this year. He has been responsible for both industrial and trade sales in a 15 state area.

Associated with the paint industry since 1933, Mr. Chambers held sales positions with National Lead Co. and Benjamin Moore & Co.

AMOCO CHEMICALS

George Rieger has been appointed director of market research and development, it has been announced.

From 1954-58, Mr. Rieger was manager of market research for Diamond Alkali Co. Prior to this, he had been associated with Hercules Powder Co.

Mr. Rieger received a master's degree in chemical engineering from the University of Minnesota in 1941.

PITTSBURGH PLATE

Harry J. Paulus has been named manager of building product sales for the fiber glass division, it has been announced.

Mr. Paulus will be responsible for marketing of fiber glass building insulation for home and commercial construction.

Mr. Paulus joined the division in 1954 as assistant manager.

He is a graduate of Ohio State University.

U. S. RUBBER

Dr. Wesley S. Coe has been appointed director of research and development for the Naugatuck Chemical division, it has been announced.

Dr. Coe replaces **Dr. D. Lorin Schoene** who has been appointed assistant director of research and development for the rubber company.

In his new post, Dr. Coe will supervise all research and development work at six of the division's research laboratories.

Dr. Coe joined the company as a research chemist in its General Laboratories in 1936 after receiving a doctorate degree in chemistry at the University of Illinois.

AMERICAN CAN

C. F. Heiberger has become central area manager of manufacture of the Canco division, it has been announced.

He succeeds **W. F. May,** transferred to New York as national sales manager of the firm's processed food containers.

A veteran of 33 years with the can company, Mr. Heiberger started at the firm's Newark machine shop in 1925, following his graduation from the Stevens Institute of Technology.

He has held a number of manufacturing posts, serving as plant manager of both the Austin and Indianapolis plants.

In 1950, he became assistant manager of manufacture of the central area in Chicago and was named assistant general manager of manufacture for the company in 1955.

Mr. Heiberger's new assignment will cover 25 container plants.

NOPCO

I. Alfred Biondi has been appointed to the position of director of materials, handling, and distribution, it has been announced.

In this newly created position, Mr. Biondi will work with the sales department and customers in matters of packaging and transportation of products.

Also, Mr. Biondi will be in charge of traffic, shipping, receiving, and warehousing operations for the company's various branches throughout the country.

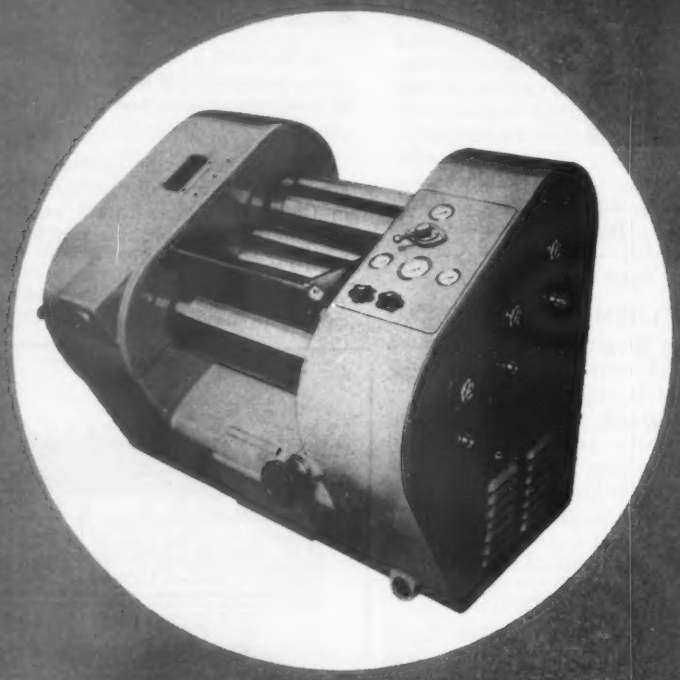
Mr. Biondi attended the Academy of Advanced Traffic and Fordham University.

He is a member of the American Society of Traffic & Transportation.

SCHOOL BUS
STOP
Now—a greater stability in exterior finishes!
IMPERIAL
Regal Yellows
IMPERIAL PAPER & COLOR CORP.
Pigment Color Division
REGAL YELLOWS, although less clean initially than conventional Chrome Yellows, show considerably less change on exposure. The result is REGAL YELLOWS show up cleaner and brighter after exterior exposure. REGAL YELLOWS are useful for exterior paints and enamels used on school buses, taxicabs, trucks, farm equipment, etc. where resistance to darkening on exposure is important.
REGAL YELLOWS also exhibit a useful improvement in alkali resistance compared to conventional Chrome Yellows.
For samples and further information contact us direct or one of our branch offices below.
BOSTON • NEW YORK • PHILADELPHIA • PITTSBURGH
CLEVELAND • DETROIT • CINCINNATI • ATLANTA
LOUISVILLE • CHICAGO • ST. LOUIS • HOUSTON • DALLAS • LOS ANGELES • OAKLAND • SAN FRANCISCO
PORTLAND • SEATTLE • TORONTO, ONT. • ST. JOHNS, QUE.

New fully hydraulic

BUHLER 3-Roll Mill



SDA
Roll Dimensions: 10" x 20"

SDT
Roll Dimensions: 16" x 32"
16" x 40"

• Up to 60% higher output

• Absolutely even pressures for uniformly fine grinding

1. New hydraulic regulating system provides absolute pressure stability and easiest (1 second) setting of rolls.

2. Determines exact pressure for any formula and duplicates it for that formula at any time.

3. Rolls disengage for cleaning in *1 second*. A simple hand-lever shift disengages rolls and scraper blade instantly. By shifting hand-lever back to operating position, rolls and scraper blade are restored to the exact pressure they were set at before disengaging.

4. New feed hopper arrangement increases working surface. Hopper cheeks do not rest on the roll, but are hydraulically pressed to the shoulder of the roll; permit grinding across the whole length of the roll, with even wear.

5. Hydraulically operated scraper blade maintains selected pressure irrespective of wear. Never loses pressure — hydraulic control takes up automatically to maintain exact selected pressure with wear.

6. Can be furnished with variable speed drive for the first roll, or driven by a 2- or 3-speed motor. Regulating the speed of the first roll for paints and inks of different consistencies increases the capacity 60% and more.

BUHLER BROTHERS, INC. (U.S.A.)
130 COOLIDGE AVENUE, ENGLEWOOD, NEW JERSEY
SALES REPRESENTATIVES: Hans Zogg, Los Altos, Cal.
Arthur Kunz, New Orleans, La.

BUHLER BROTHERS, (CANADA) **LTD.**
24 KING STREET WEST
TORONTO 1, ONTARIO

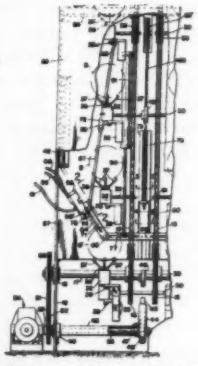
PATENTS

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired (to foreign countries $1.00 per copy) to the publisher.

Apparatus For Spray Coating Balls

U. S. Patent 2,838,024. Paul Rekettye, Akron, Ohio, assignor to The Sun Rubber Co., Barberton, Ohio, a corporation of Ohio.

Apparatus for spray coating balls comprising an upright frame, an endless conveyor vertically movable on said frame, longitudinally spaced horizontal shafts journaled transversely of the conveyor, means to axially rotate said shafts, a set of upwardly directed fingers on the end of each shaft for rotatably supporting a ball in upright position for rotation on its vertical axis and having a uniform circumferential spacing at their upper ends less than the largest diameter of a ball, counterweighted gear means on each shaft for transmitting rotation of said shaft to said fingers, means movable with the conveyor for rotatably mounting a spray device for rotation concentric of each succeeding ball on an axis perpendicular to its axis of rotation, and means operated by the conveyor for successively dumping coated balls from each set of fingers.



U. S. Patent No. 2,838,024

Chlorinated Polyphenyl

U. S. Patent 2,840,486. Samuel N. Hunter, East St. Louis, Illinois.

A composition of matter comprising pigment and a wetting agent containing both volatile and non-volatile ingredients and having as its major non-volatile ingredient chlorinated polyphenyl having a chlorine content of at least 60%.

Aqueous Latex Paint

U. S. Patent 2,837,444. Frank J. Hahn, Springfield, Mass., assignor to Monsanto Chemical Co., St. Louis, Mo., a corporation of Delaware.

A porous surface carrying an undercoat of a quadri-component interpolymer admixed with an oil modified alkyd resin and a top coat of a quadricomponent interpolymer, said quadricomponent interpolymer containing about (1) 35-60 parts of an unsaturated ester of the group consisting of straight-chain and branched-chain saturated aliphatic alcohol esters of acrylic and methacrylic acid containing a total of about 5-20 carbons in the alcohol radical of which about 5-14 carbon atoms comprise the longest continuous chain thereof, (2) 3-10 parts of an unsaturated nitrile of the group consisting of acrylonitrile and methacrylonitrile, (3) 2-5 parts of an unsaturated monocarboxylic acid of the group consisting of acrylic acid, methacrylic acid, cinnamic acid, atropic acid and crotonic acid, and (4) correspondingly, 60-25 parts by weight of a monovinylidene aromatic hydrocarbon, said quadricomponent interpolymer having been prepared by first partially polymerizing all of the nitrile component with from 1.5-3 times its weight of vinylidene aromatic hydrocarbon component, then adding the remaining components and finally completing the polymerization reaction, said oil-modified alkyd resin consisting of a polyhydric alcohol containing at least 3 hydroxyl groups, a polycarboxylic acid and a member of the group consisting of drying oils, semi-drying oils, drying oil acids, semi-drying oil acids and mixtures thereof, said resin containing from 5-25 weight

From Heyden Newport

Earl Barkley and New York Branch Manager, Ted Risch, confer on customer's problem.

PENTEK* PLUS TECHNICAL SERVICE CUTS ALKYD COSTS

Problem: To develop a low-cost flat wall paint vehicle having low solids content and high viscosity—in either odorless or regular mineral spirits.
Solution: Heyden Newport Technical Service, assisting the customer, experimented with tall oil fatty acids and Pentek-glycol combinations.

Result: High-viscosity, low-solids alkyds, produced at a raw material cost of only 8 to 9 cents per pound of resin solution. In flat wall paints, these resins offer excellent non-penetration, scrubability and sheen uniformity, over primed and unprimed surfaces.

For more information on the above problem solution, and for technical assistance in improving your products and processes, write or call Heyden Newport Chemical Corp., 342 Madison Ave., New York 17, N. Y.

*Trade-name for Heyden Newport Pentaerythritol.

HEYDEN NEWPORT

Where tradition meets tomorrow in chemical progress

per cent of polycarboxylic acid, and from 55-88 weight percent of oil acids with the balance being polyhydric alcohol.

Protective Coating Composition

U. S. Patent 2,838,414. Claude J. Dunphy and Clinton J. Dunphy, Minneapolis, Minn.

A protective composition for roofs, metal surfaces and the like, in which are included as essential ingredients and in intimate admixtures, coal tar, powdered aluminum, ground asbestos, gypsum and lead oxide in approximately the proportions of coal tar 50 gallons, powdered aluminum 7 pounds, ground asbestos 10 pounds, gypsum 8 pounds and lead oxide 8 pounds, the coal tar being thinned and the mixture liquefied by the addition of gasoline and kerosene.

Water-Soluble Shellac Powder

U. S. Patent 2,834,770. Walter Kalkhof-Rose, Mainz, Germany.

A shellac powder obtained by spray drying at elevated temperatures not exceeding 70°C. a shellac solution with a pH of between 5-6.7 and a moisture content of between 40-80% by weight, the solution being prepared by subjecting at room temperatures between 15-40% by weight of chlorine bleached shellac, free of bleaching residues and while still wet, to the action of between 2-12% by weight of a fixed alkali selected from the group consisting of borax, caustic soda, potassium hydroxide, sodium perborate, ammonia, sodium phosphate and triethanolamine, the spray-dried powder being dry, non-adhesive, of uniform fine mesh, non-blocking, stable at above refrigeration temperatures, having a liter weight of about 0.2, a gravity of about 6.5-6.6 Bé., an acid number of about 60-65 and being dispersible in water without addition of alkali, the aqueous dispersion of the powder having a pH not exceeding 6.7.

Red Lead Composition With Improved Flow Properties

U. S. Patent 2,836,483. William Earle Schulz, Wenonah, N. J., assignor to E. I. du Pont de Nemours and Co., Wilmington, Del., a corporation of Delaware.

A red lead composition of improved flowing properties consisting essentially of red lead and a thiuram disulfied-stabilized chloroprene polymer obtained by polymerization at 10°C. in an aqueous emulsion in the presence of an aliphatic mercaptan, said chloroprene polymer being present in the amount of 0.2-1.0% by weight based on the red lead.

Coating Compositions

U. S. Patent, 2,838,464. Walter Keigwin Moffett and John Daniel Pickens, Flint, Mich., assignors to E. I. du Pont de Nemours & Co., Wilmington, Del., a corporation of Delaware.

A liquid coating composition, which produces a dry light-colored coating characterized by resistance to discoloration from contact with oil, grease or tar, comprising lacquer grade nitrocellulose, alkyd resin modified with 25%-35% by weight of a member of the group consisting of coconut oil and coconut oil fatty acids as the only oil modifier in said resin, polyester plasticizer of the class consisting of 2-ethyl hexanediol adipate, propylene glycol sebacate and propylene glycol adipate, and volatile organic solvent, said plasticizer having a boiling point above about 325°C., having a solubility in water at 25°C. of less than 0.005% by weight, and producing a cloudy mixture when mixed with an equal weight of n-hexane.

Mildew Resistant Paint

U. S. Patent 2,837,433. Robert F. Heran, Sr., Cleveland, Ohio, assignor to The Pioneer Manufacturing Co., Cleveland, Ohio, a corporation of Ohio.

A mildew resistant, drying oil-base, paint composition consisting essentially of a pigment including ferri-ferrocyanide, copper naphthenate and a vehicle suitable for use with copper naphthenate, the ferri-ferrocyanide and the naphthenate being present in amounts between about 0.36% and about 3.62% by volume of the paint composition and between about 1.0% and about 3.0% by volume of the paint composition, respectively.

How to select, apply and disperse the 11 members of the Syloid family

New 12-page booklet tells what specific industrial applications each Syloid answers—and why!

What are the Syloids? What are their important typical chemical-physical characteristics? What are their individual properties? What Syloids should be used to create a flat finish? . . . in anti-blocking? . . . to thicken a liquid? . . . to remove moisture? . . . in adhesive formulations? . . . for insulation? What mixing techniques should be used for Syloid in a liquid, in a dry powder?

You'll find the answers to these and other questions in the just-off-the-press booklet, "The Davison Family of SYLOID SILICAS." We're sure you'll find it of great assistance in your everyday work. For your copy, just write to us on company letterhead.

DAVISON
CHEMICAL COMPANY
Division of W. R. Grace & Co.
Baltimore 3, Maryland

Technical Tips for TITANOX* no. 78

Q. *What should determine the choice of a rutile titanium dioxide for use in latex paints?*

A. *Mainly high hiding efficiency—the most hiding for the money.*

Full value per pound of titanium dioxide pigment is realized in latex paints only when you can use the minimum amount of this pigment to obtain the brightness and opacity you need. The most distinguishing mark of the suitability of a rutile titanium dioxide pigment for use in water emulsion paints is its hiding efficiency. To be sure, there are other requirements, such as ease of dispersion and adaptability to the conditions that govern full stability of the emulsion system. But if a rutile titanium dioxide pigment should possess all other requirements yet lack the power to brighten and to opacify at minimum loading, it could not be the preferred pigment for latex paints.

It is high hiding efficiency, complementing all other desirable qualities, that distinguishes TITANOX-RA-50 as the rutile titanium dioxide preferred for use in latex paints.

Take the paints shown in the example above. With as low as 1.5 pounds of TITANOX-RA-50 per gallon of paint, note the relatively high opacity and high brightness obtained. With 2.5 pounds of this pigment per gallon, there was complete hiding as indicated by 98% contrast ratio over black and white.

For the general run of surfaces to be covered, the brightness and opacity shown above for 1.8 pounds of TITANOX-RA-50 per gallon is often considered adequate, especially when light tints are also involved. Incidentally, by using 1.8 pounds in this case instead of 2.5 pounds of TITANOX-RA-50, the cost per gallon of the paint is reduced by 18.5¢ (at current prices).

Example of Brightness and Hiding of some White Latex Paints

(For illustrative purposes only; not to be applied to any emulsion paint system selected at random.)

Pounds of TITANOX-RA-50 Per Gallon of Paint	Hiding (dry film thickness approx. 2 mils) Brightness %	Hiding (dry film thickness approx. 2 mils) Contrast Ratio (over Black & White) %
2.5	89.9	98.0
2.0	89.2	97.0
1.8	88.9	96.4
1.5	87.8	95.7

Because of the complexity of water emulsion paint systems, no general rule can indicate the amount of titanium dioxide needed in any paint. But in systems balanced in the factors essential to latex paint stability and performance, the utmost attainable in rutile titanium dioxide is assured by the use of TITANOX-RA-50.

To help you get the most out of your titanium dioxide pigmentation, ask our Technical Service Department to share in solving your latex paint problems. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.

6328

®TITANOX

the brightest name in pigments

*TITANOX is a registered trade mark of National Lead Company for titanium pigments offered by Titanium Pigment Corporation.

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

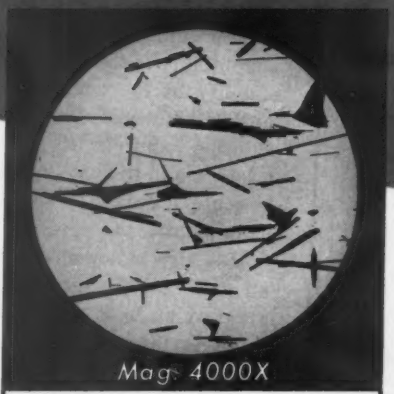
SAVE UP TO 10¢ A GALLON with XX-602

(LEAD FREE)

ZINC OXIDE

HIGHEST CONSISTENCY
FULLY ACICULAR

No Colloidal Fines



Mag. 4000X

HORSE HEAD® XX-602 is a major development to help you cut the cost of exterior house paints.

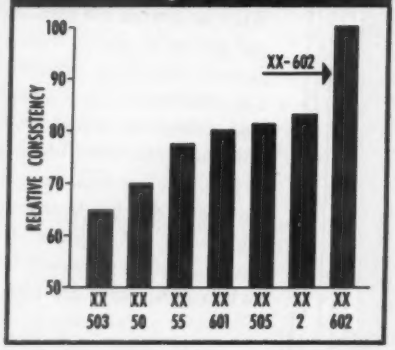
MORE BODY

You need only take advantage of its extra high consistency. Its long, fine needles give house paints as much as 10 K.U. more body than conventional zinc oxides. And XX-602 holds its body in the can exceptionally well because it is free of reactive fines.

REDUCE YOUR PIGMENT CONTENT

Cut back that extra body, if you wish, with additional combined vehicle or thinner . . . and count your savings.

Send for a sample of XX-602 now.



THE NEW JERSEY ZINC COMPANY

Founded 1848

160 Front Street, New York 38, N. Y.

BOSTON CHICAGO CLEVELAND OAKLAND LOS ANGELES

Also Distributed by

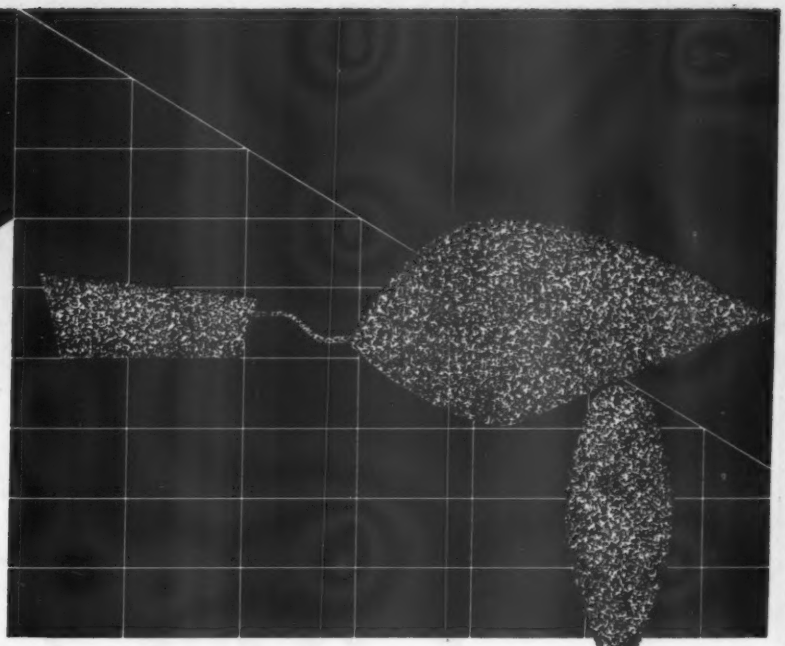
VAN WATERS AND ROGERS

SEATTLE PORTLAND (ORE.) SPOKANE VANCOUVER, B. C. DALLAS HOUSTON

ST. LAWRENCE CHEMICAL COMPANY, LTD.

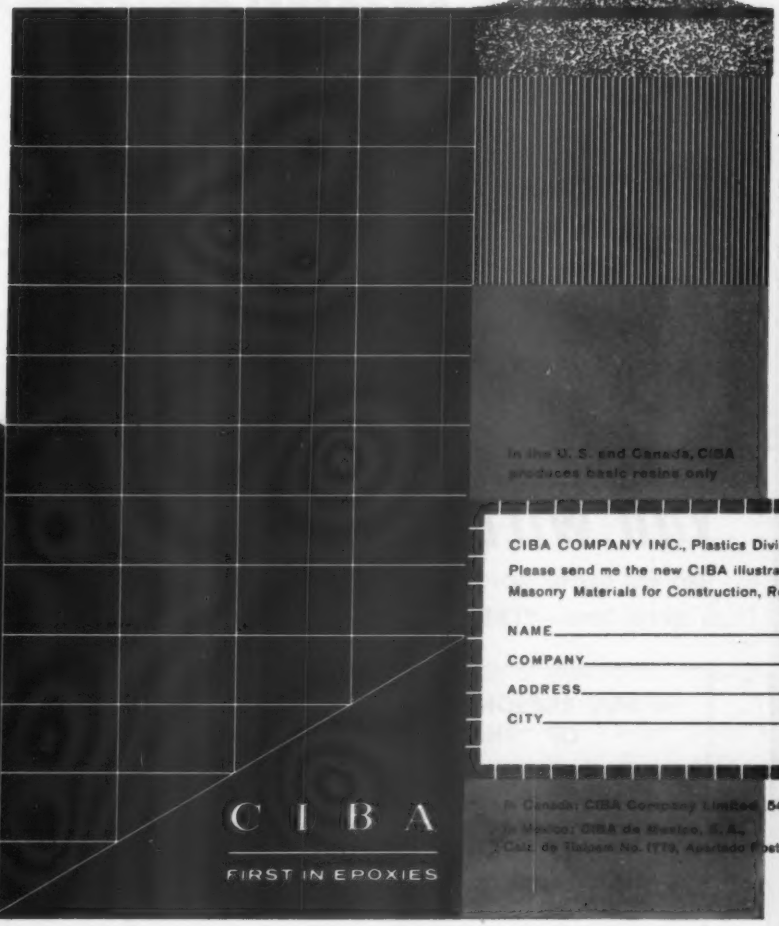
TORONTO, ONT. MONTREAL, QUE.

HORSE HEAD PRODUCTS ®



Learn what CIBA Araldite® Epoxies do to provide low cost water-tight maintenance-free beauty in modern coatings formulations for CINDER BLOCKS and similar low cost MASONRY MATERIALS

MASONRY COATINGS
Are you getting your share of this ever-expanding market?



Coatings' manufacturers interested in a booming market should investigate Araldite Epoxy Resins developed specifically for masonry applications. These epoxy-based formulations provide water-tight, corrosion-resistant, and decorative finishes that are easily applied by brush or spray. Providing a wide latitude for modification, Araldite Epoxies can be formulated to meet your customers' exacting and varied requirements.

In the U. S. and Canada, CIBA produces basic resins only

PVP8-8

CIBA COMPANY INC., Plastics Division, Kimberton, Pa.

Please send me the new CIBA illustrated booklet "Epoxy-Based Masonry Materials for Construction, Rehabilitation and Maintenance."

NAME_____

COMPANY_____ TITLE_____

ADDRESS_____

CITY_____ STATE_____

In Canada: CIBA Company Limited, 548 King St., West, Toronto 2B, Ont.
In Mexico: CIBA de Mexico, S. A., Calz. de Tlalpan No. 1779, Apartado Postal 10262, Mexico 21, D. F.

CIBA

FIRST IN EPOXIES

PAINT and VARNISH

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINIS

FREE!* to subscribers ONLY

*Special Offer to Paid-Up Subscribers of PAINT & VARNISH PRODUCTION See details below . . . Act Now!

YOU WILL RECEIVE FREE OF CHARGE

with your paid-up subscription to **"PAINT & VARNISH PRODUCTION"** a special bonus—**"THE REVIEW AND BUYERS' GUIDE"** for **1959**—worth $3.50 a copy.

FIVE REASONS WHY YOU SHOULD HAVE YOUR OWN COPY OF "THE REVIEW AND BUYERS' GUIDE" FOR 1959

- ★ Most authoritative and complete review of '58 developments in paint manufacture.
- ★ Only complete "Buyers' Guide" to new materials and equipment announced in '58
- ★ Most complete directory of manufacturers supplying the paint industry.
- ★ Latest Directory of Suppliers' Agents & Jobbers of materials and equipment.
- ★ Most complete Product List and Trade Name Directory.

ALHAMBRA, CALIF. — *"I consider the* **REVIEW** *a great time saver."*

•••

DES MOINES, IOWA — *"A very helpful edition."*

•••

LOS ANGELES, CALIF. — *"Keep up the good work."*

•••

JERSEY CITY, N. J. — *"A perfect job. Most interesting and worthwhile."*

•••

SEATTLE, WASH. — *"Very fine as is."*

•••

QUINCY, MASS. — *"Your* **REVIEW** *serves as a check list through its advertisements."*

•••

MONTREAL, CANADA — *"Quite satisfactory and comprehensive. Serves as check list through its ads."*

•••

BROOKLYN, N. Y. —*"We use it regularly."*

•••

CHICAGO HEIGHTS, ILL. — *"Your* **REVIEW** *serves a useful purpose."*

•••

NEWARK, N. J. — *"Your* **REVIEW** *serves as a check list thru its listings and ads."*

•••

WINLOCK, WASH. — *"The* **REVIEW** *is used by our Chemists and Formulators."*

•••

GRAND RAPIDS, MICH. — *"The* **REVIEW** *helps keep us abreast of latest technical developments."*

Review and Buyers' Guide
Single Copy $3.50
Postpaid to any address.

Make sure you have at your elbow throughout 1959

1. The Complete **Buyers' Guide** to New Materials and Equipment
2. The **Only** Complete Review of '58 Developments in the Paint Industry
3. **The** Directory of Suppliers to the Paint Industry
4. The **Only** Directory of Suppliers' Agents & Jobbers
5. The **Most Complete** Product List and Trade Name Directory

AVAILABLE ONLY IN THE *"Review and Buyers' Guide"*

GUARANTEE YOUR COPY • FILL IN FORM • RETURN TO US

858

PAINT and VARNISH PRODUCTION
855 Avenue of the Americas
New York 1, N. Y.

SUBSCRIPTION RATES: Payable in Advance	One Year	Two Years
U. S. & Possessions	$3.00	$5.00
Canada	3.00	5.00
Mexico & Pan-American	4.00	7.00
All Other Countries	8.00	15.00

Remit by Bank Draft drawn on New York Bank or U. S. Dollar Funds.

Gentlemen:

Please enter my subscription to PAINT AND VARNISH PRODUCTION for .....year(s). ☐ Send Bill ☐ Payment Enclosed ☐ New ☐ Renewal
(To include free copy of "Review and Buyers' Guide" for 1959)

Name_____ Title_____
Company_____
Street_____
City_____ Zone____ State_____
Products manufactured_____

abstracts

The following are abstracts of papers presented at a recent meeting of the German Chemical Society, Paint and Pigment Division.

Analytical Examination of Polyester Condensation

By W. Reiser

The most important aid for tracing the esterization of multi-basic acids and multivalent alcohols was shown by the author to be the determination of the acid number. In recent years, a number of technical publications have appeared on this subject. A critical consideration was given of these publications. It was pointed out that it might be desirable to use the total acid and the free anhydride content methods to determine the extent of the reaction; such as employed in the manufacture of synthetic resins. Dicarbonyl acid anhydride was used as one of the reactants.

The author proposed the partial acid number for rendering of value comprising the free carboxyl groups present. This includes a carboxyl group of the dicarboxyl acid anhydride, and another group which is transformed into the methyl ester. Also the total acid number, by which the free carboxyl groups, including the anhydride carboxyls, are ascertained. The free anhydride content can then be calculated according to given formulas from the values found.

The author then described the working stages of the individual determinative processes in detail, and discussed the course of some reactions of various polyols with the dicarbonyl acid anhydrides added. An indication was given of the difficulties encountered when working with lacquer synthetic resins with free anhydride content. These can be precisely determined on the basis of the analytical procedures.

The paper covered a broad scope of lacquer synthetic resins (non-modified and oil-modified phthalate resins, unsaturated polyester resins, malinate resins, etc.). In the case of the dicarboxylic acid anhydrides, the raw materials used, among others, were phthalic acid, maleic acid, tetrahydrophthalic acid, tetrachlorphthalic acid anhydride and rosin-maleic acid adduct.

The following characteristics were proposed for the rendering of the total acidity and the free anhydride content:

1. $AN_{part.}$ (partial acid number).
2. AN_{total} (total acid number). As mentioned above, this comprises the free carboxyl groups including that of the anhydride carboxyls, which are so hydrated that a saponification of already formed ester linkages does not occur. The method should not be disturbed by free alcoholic or phenolic hydroxyl groups present in the tests.

The free anhydride content, in per cent, can then be calculated according to the formula:

$$\frac{2\,(AN_{total} - AN_{part.})\,.100}{(AN_{total})\text{ acid anhydride}}$$

The determination of these characteristics is conducted as follows:

1. $AN_{part.}$ The test sample is dissolved in 50 cc. of a mixture of absolute benzene-methyl alcohol in the volume ratio of 2:1 (certain types of resin require a higher methyl alcohol content) at room temperature. The solution is titrated with methyl alcoholic caustic potash, O.I.N. and free from water, using thymolphthalein as the indicator. This method gives values which are too high with the presence of water in the solvent medium mixture causing the anhydride to become somewhat hydrolized.

2. AN_{total} The test sample is dissolved in warm water containing solvent medium mixture (30 cc. methylethylketone plus 14 cc. tertiary butanol plus 6 cc. of water), heated for 30 minutes to 75 C. and after cooling, titrated with thymolphthalein against O. I. N. aqueous caustic potash. With maleic acid resins, it is preferable before the titration to cool it down to 0°C. or below, in order to achieve a better end point.

In the discussion of this paper, it was mentioned that the application of the unsaturated polyester resins in the lacquer industry had been publicized in Germany more than in other countries. Consequently, it has become increasingly necessary, to conduct analytical work in this field. It was asked as to whether the equilibrium position in the system-phthalic acid anhydride plus glycerine in relation to the temperature had been investigated. Similar investigations have been conducted in the Stuttgart Institute, among others, on the system of epoxy resin and dicarboxyl acid anhydride. It was stated that there were many influential factors. Above 220°C., according to investigations conducted by the author, the re-formation of phthalic acid anhydride becomes stronger than below this temperature. An additional factor affecting this equilibrium was, what is termed, "the vessel constant." Also a dependency on the nature of the protective gas used-carbon dioxide or nitrogen-can be expected.

Unsaponifible Film from Fatty Acids

By J. D. v. Mikusch

The author first indicated the problems which had arisen at the commencement of these investigations, the conclusions of which produced valuable data in the field of raw materials filming for the paint and varnish industries. The task had been one of preparing an oxidative filming material from herring oil. Boric acid had been used as a suitable catalyzer in the conversion operation.

In this connection and in a somewhat unexpected manner, it had been found that under certain reaction conditions, an unsaponifiable filming medium was formed which, after the addition of driers, gave very good drying films. This result had led to the further study and investigation of the reaction mechanism. It had been shown by this later work that chemical processes are based on organic chemical reactions, which up to now, have had little or nothing known of them.

By means of comprehensive investigational research, it could be ascertained that five reactilns take place during the course of the experiment. This leads to the formation of alpha-pyron and more important, to the formation of gamma-pyron. This is due to the mutual reaction of four fatty acids with the splitting-off of water along with carbon dioxide. The characteristics of this new filming medium were given in full detail, particularly the iodine number, acid number, drying, brightness and stability. Also given were the drying processes occuring during film formation, alkali stability and elasticity. These new products have been called, provisionally, Unsapoles.

The work was started from the accidental observations made during the investigations of the drying problems associated with fish oil products. When boric acid had been used as a catalyzer, it was found that a drying residue was suddenly obtained. Further investigations showed that the unsaponifiable portion dried better than did the whole mass. It was shown diagram-

matically as to which reactions were fundamentally possible with the fatty acid molecules. Also mentioned was that products obtained in this manner possess a pyrone structure.

The catalytic condensation of stearic acid was investigated as a model case and the production of unsaponifiable film formers from fatty acids was demonstrated using examples of tall oil and soya oil. Detailed study of the filming characteristics of products of this type prepared from soya, linseed and ground nut oil were studied in closer detail. It was found that there was a higher and more rapid weight increase in drying, than found with normal drying-oils. Particularly, in the case of the oils with a low iodine number, the decrease in drying time made itself particularly noticeable. Also, with regard to moisture swell-absorption and exposure to alkalies, a better behaviour was established than with normal drying-oils. The author demonstrated this by means of diagrams and diapositives, These condensation products showed that it is a dark, stand-oil-like material which brightens in the drying process. Further investigation employing film testing processes such as the rod-bend test after thermal aging showed characteristics which do not clearly manifest themselves with the normal drying-oil products. It was pointed out by the author that this paper indicates that we are at the beginning of a new processing direction and that there is still much research to be carried on in this field. Up to now, only a broad survey of this new field of development with the drying-oil, filming materials has been presented.

A long discussion followed this most important paper, during which many interesting points were raised and considered. The discussion first considered the relationships between the drying characteristics and the iodine number. A question was asked on how the change in the iodine number aids in better drying characteristics. It was explained that in the pyrone ring formed in the new product, there are contained new conjugated double linkage systems. The structure of the ring and constitutional questions were shown. It would seem that the hydrogenation iodine number would be more likely to give the relationships in the molecule than the iodine number method by Wijs.

The point was then raised as to whether an investigation had been conducted on how far an accelerated and increased degradation of the film occurred through increased oxygen absorption which could act in a negative manner on weathering. It was stated that investigations conducted up to the present had shown that the condensation products do not show the degradation (breakdown) of the normal drying oils. However, a report could be given at some future date, on long-term weathering tests still in progress. It was stated from another source that increased oxygen absorption could serve as the nucleus for the early destruction of the film. This conception was, however, strongly rejected by the author, who stated that the drying power of an oil and its oxygen absorption would not rise beyond reason. If one wishes to prepare condensation products of this type, he must not start with drying oils which are adequate in themselves from the filming aspect. Starting products are chosen on the basis of an even iodine number (e. g. 120). After the processing treatment, these products would then dry more rapidly and harder than would a linseed oil. It is from this view point that the paper should be considered and that all the comparisons should be understood.

Regarding the question of possible film break-down being increased by the increased oxygen absorption, it was further pointed out that control is also exerted in this direction. This is due to the fact that with the building-up of the new filming materials, a definite choice in fatty acids as the starting point is therefore possible. Accordingly, one can direct the oxygen absorption with the drying in a definite manner.

The question of yellowing of the film was raised. This is a matter that largely concerns long-term weathering tests which are being conducted at the moment. These would tend, in themselves, to exclude any weak-yellowing tendency.

Investigate the McDANEL Mill Head Assembly

GREATER CONVENIENCE • LESS CONTAMINATION

The McDanel Mill Head Assembly has continually increased in popularity since first introduced more than 25 years ago.

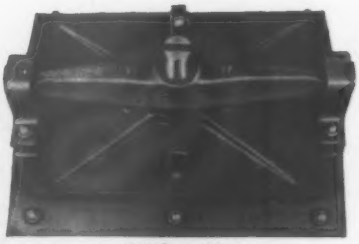
Special overhanging type ceramic frame brick and door blocks protect your batch from iron contamination due to milling.

Combination grinding and discharge door permits unloading of wet grinds without removing the door. Dry grinding and discharge doors are also available.

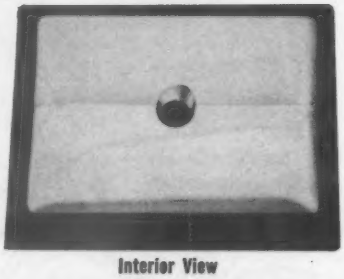
Your mill builder can install on new equipment, or you can install on your present mills. Do it the next time you reline.

Write for descriptive catalog and price list for Assemblies, High Density or Standard Ceramic Mill Lining Brick and Ceramic Grinding Balls.

Write today for Bulletin



Full Assembly



Interior View

Solid Door for Dry Grinding

McDANEL Industrial CERAMICS

McDANEL

REFRACTORY PORCELAIN COMPANY

BEAVER FALLS • PENNSYLVANIA

It was asked that with the chemical composition given, what proof had been obtained that four fatty acid molecules participated to form the condensation product and the pyrone. It was stated that in ascertaining the structure, tests were made on selected model compounds; low-chained fatty acids were used at the start. The simplest pyrone compound was the dimethyl pyrone. By further tests with higher members of the fatty acid family, the building-up of the higher-molecular pyrone derivatives and their structural investigation had been arrived at. With this, various pyrone isomers were formed. The author had followed the formation of the gamma-pyrone up to caproic acid, there being no doubt that his investigation was dealing with the corresponding product.

Regarding the problem of the iodine number further, it was clear that substitution processes occur in the entire complex accordingly. As already indicated, one would question as to whether the hydrogenation iodine number should be utilized.

As this new process is intended to produce large scale commercial products for the paint industry, it should be noted that the practical question of the yield percentage obtained with the condensation processing is of utmost importance. According to the reaction formula, the yield lies at 85%.

In considering the yield, the splitting-off of the water and of the carbon dioxide must also be considered.

It is interesting to compare the advantages of these new filming products as compared with the normal fatty acid products used at present in the paint and lacquer industries. A useful comparison can be made in this connection, for example, with the alkyd resins. It was stressed that one of the great advantages of these new filming products is their lower saponifiability when in contact with alkalies. Because of this, a higher alkali resistance is obtained, although it is still not 100%. Further improvements can be obtained by removal of the residual acids. The good drying characteristics of the pyrone filming materials should also be kept in mind with this comparison.

The question of the iodine number was raised again. It was pointed out that the iodine number determination can be appreciably disturbed by the influence of light. It would appear advisable to work in the dark. It was stated that all iodine number determinations give values which are dependent to a considerable extent on secondary circumstances.

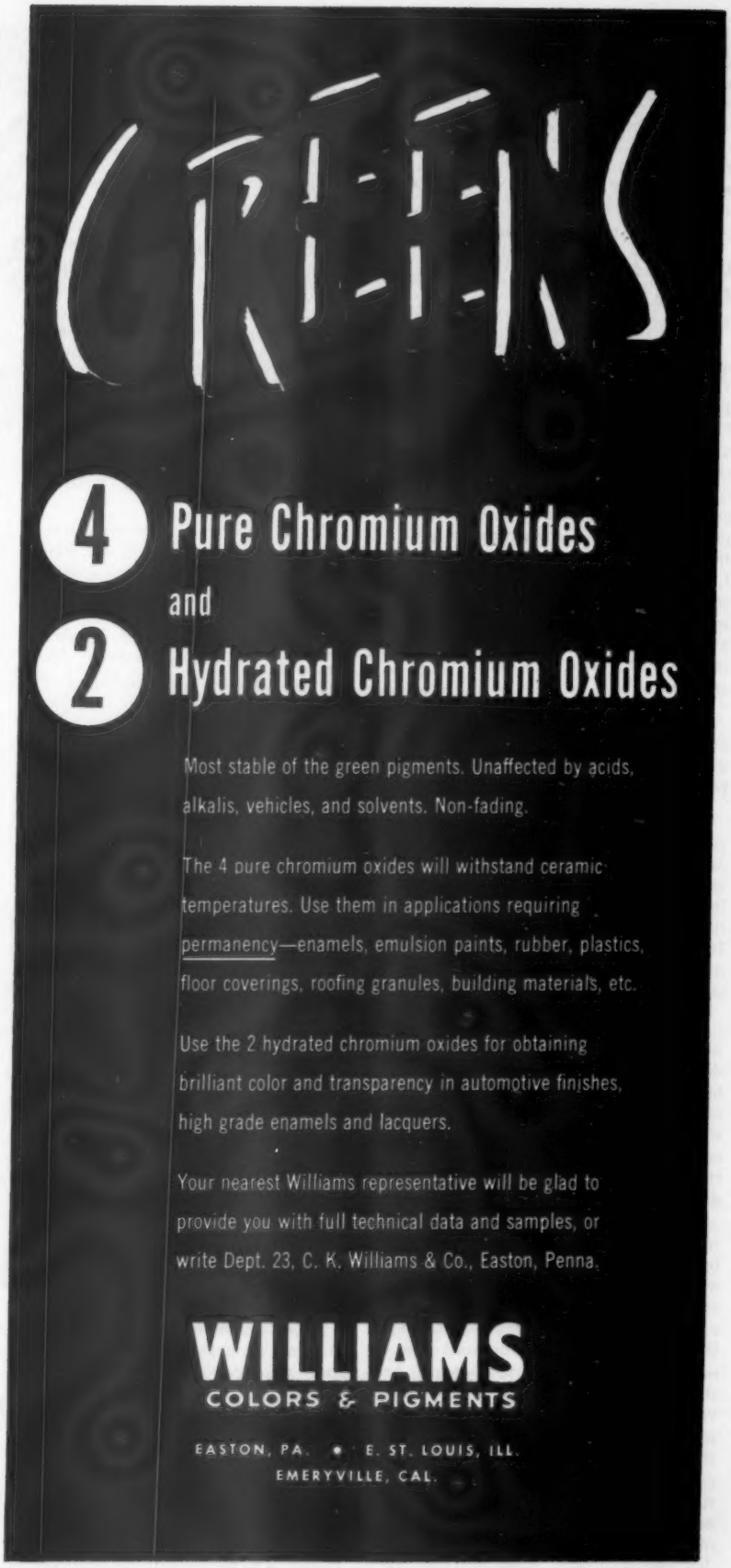
It was pointed out that ring systems with film-formers are already known; for example, the Chroman ring formation with the phenol resins. The ring formation with the pyrones could be understood from this parallel.

A number of interesting questions regarding the actual production and processing were then raised and considered. It was pointed out that linseed oil becomes brighter after blowing. Then it was asked, as in the case of these darker condensation pyrone products, if a brightening could be achieved by means of blowing. It was stated that many tests of this nature are being conducted but at the moment, no conclusive results could be stated.

A question arose as to the comparison of these new products with other upgraded products of the drying oils, and the behaviour of the condensation pyrone products of drying oils when used in the modification of the non-drying alkyd resins. Dr. Mikusch, in reply, gave the example of ground nut oil which, in the form of the condensation products of the fatty acids, acts in a manner very similar to linseed oil. Regarding the conversion of products such as ground nut and cotton seed oils which are non-drying oils into oxidative drying products, it must be understood that this development work with the condensation into pyrones as outlined is still in its early stages. Investigations on the obtainable possibilities are not yet completed. Thus it cannot be said as to what the limits of application are.

As to the characteristics of the films obtained with these condensation products, such as weathering resistance, aging resistance and pigment absorption characteristics, tests in this connection also are still in progress. It has been found that the weathering resistance lies within the scope expected but does not, however, offer anything sensational. Thus far, the results indicate that the processed material obtained from the basis of safflower oil has behavioured well. The pigment compatibility of these condensation products is variable according to their nature. Obviously, with the pigment compatibility, the residual acid number of the product plays a decisive role. Products have been prepared where one or the other are compatible with active pigments–without going beyond that stage. However, other products were incompatible.

In regard to the question of fungus and mold resistance, it was thought that under some circumstances these products could have good fungus resistance since fungi always attack the glycerine group first. With these condensation products, the glycerine group is absent.


4 Pure Chromium Oxides
and
2 Hydrated Chromium Oxides
Most stable of the green pigments. Unaffected by acids, alkalis, vehicles, and solvents. Non-fading.
The 4 pure chromium oxides will withstand ceramic temperatures. Use them in applications requiring permanency—enamels, emulsion paints, rubber, plastics, floor coverings, roofing granules, building materials, etc.
Use the 2 hydrated chromium oxides for obtaining brilliant color and transparency in automotive finishes, high grade enamels and lacquers.
Your nearest Williams representative will be glad to provide you with full technical data and samples, or write Dept. 23, C. K. Williams & Co., Easton, Penna.
WILLIAMS
COLORS & PIGMENTS
EASTON, PA. • E. ST. LOUIS, ILL.
EMERYVILLE, CAL.

It was asked if other similar compounds could be used to catalyze the reaction, instead of boric acid. Dr. Mikusch stated that from the patent protection viewpoint, a great number of compounds had already been investigated as catalysts. This includes many boric acid derivatives as well as other compounds. Their suitability for use as a catalyst for this purpose is variable.

Electrostatic Paint Spraying in Germany

By O. Renner

The principles of electrostatic paint spraying were known a long time ago. The author elaborated on this point by describing an old picture dating back to 1740, which showed that this principle was understood at that time. At present, four concerns are interested in the commercial practice of developing and extending the techniques of electrostatic paint spraying. The concerns in question are the U.S. Ransburg firm, the Lurgi concern, the Hochspannungsgesellschaft firm and the AEG firm–the last three being German firms. The work of these firms was briefly described by the author and compared with one another.

It was emphasized that with the adoption of the electrostatic paint spraying process, automatization had become perfected.

The AEG electrostatic paint spraying process was then discussed in full detail, and it was stated that with this process, stationary spray parts are used. One is in the position of controlling the particle flow stream with the help of electrodes. With these parts, "control latices" are introduced as stop, suction and guiding electrodes.

The design features of the spray units were then discussed by the author in detail. Examples of layouts which had been executed on these principles were introduced. The high voltage installation feeding the plant was also considered along with the spray chamber with the ventilation arrangements. Other details discussed in connection with the plant layout were the handling and transporting equipment for the parts to be sprayed and the finished sprayed ware, the electrical remote control equipment, the fire protective arrangements and drying ovens for stoving. With the AEG electrostatic paint spraying units, it is possible to pass over to the hot spraying method without solvents. Finally, it was shown how in practice, wih mass production flow lines, the transition from the normal spray gun process to the electrostatic paint spraying process can be made in the most suitable manner. The influence of the lacquer medium used was briefly discussed. It was considered that the application for electrostatic paint spraying can be considerably widened.

A discussion of this paper followed. It was asked how the various electrostatic paint spraying methods described differ in regard to the applicability of the lacquering medium and whether any impoverishment of the lacquer in solvent medium occured during the spraying. It was stated that all the lacquer spray mediums which are used with the Ransburg process can be used with the AEG process. With reference to solvent medium properties during the spraying, it has been established that the applied lacquer possessed the same viscosity as the lacquer in the storage container. The benzene hydrocarbons were proved to be favorable for the Ransburg spray process and these were also suitable for the AEG process. Solvent medium enrichment and thickening were not observed.

Where electrically non-conductive parts have to be sprayed, it was shown how this can be affected. This is so that an electrode sub-surface can be obtained. By moistening the reverse side of the parts to be sprayed, one may attain the electrostatic conditions required. This, in conjunction with the placing of electrodes as a backing under the places where the lacquer impacts, will help to give satisfactory results.

The point was raised, because of the coil changes involved, as to whether these processes would be economically sound. It was pointed out that the whole of the ware flow is united within one unit and this serves to reduce the costs. Regarding the matter of fire danger and the setting of the flash points of the solvent mediums used, it was pointed out that this has all been settled by the codes of practice worked out for the industries concerned.

Three possibilities were provided for the regulation of the amount of lacquer material sprayed on to the parts. These are the inclination of the spray aperture, furthering the ware movement during the lacquer flow cycle by fans and finally, the regulation of the voltage. Regarding the question of lacquering insulating materials, it was stated that high-grade insulation materials have not yet been tested. In the lacquering of wood and plastic, rotation of the parts has been found to be satisfactory.

Considerable economies in lacquer can be obtained with the electrostatic spray process. Thus, with the lacquering of hardboard and chip board, 97% of the lacquer sprayed was applied on the work. The width of the sprayed lacquer stream is controllable, so that the actual lacquer losses are quite small. The adoption of a flow finishing practice which is possible with electrostatic paint spraying is also of importance. The question of the influence of the shape of the workpart on the quality of the lacquering obtained was also raised. It was indicated that a spray lacquer material which will provide outstanding results with plane surfaces could fail with complex, variously shaped workparts. This need not necessarily be attributed to the lacquer itself. In this connection, questions also arose regarding bubble formation at sharp edges. It was mentioned that the workparts could be in such a combined manner that sharp edges and projection would be prevented. Mention was made of the combination possibilities of flow coating and of electrostatic spraying. The effect of the shape of the workpart being electrostatically sprayed can be considered as follows: At sharp edges, there is formed what is termed an electrical wind, which can give rise to lacquering disturbances. By using such a combination of several workparts with the hanging, a balance from the electrostatic viewpoint is then obtained. This is the same effect that is encountered in metal plating practice, where it is termed the edge effect; the means adopted in plating to counter this are much the same with the adoption of suitable racking.

The practice has already been adopted in America of using the flow coating process in combination with electrostatic spraying. The priming is applied by means of flow coating and the cover coating is then applied by electrostatic spraying. The point was raised regarding the adoption of hot spraying with the electrostatic spraying process. It was stated that spraying at a higher temperature would be possible. An oil circulation instead of water could be used and the Philipps concern had developed equipment of this type for the purpose. With a heat exchanger of this type, the temperature of the lacquer could be set to the required figure.

As to whether losses and considerable bother in cleaning arises with the changing of the lacquer charge, it was stated that with the concentrated design construction of the new electrostatic spray equipment on the AEG principle, extensive cleaning measures are not necessary. All the working parts are located close to one another in one constructional unit. With the electrostatic spraying, the flash point of the lacquer should be located above 21°C.

Correction

In the article Thixotropic Properties of Paints, under the heading "Test Set-Up" (page 26, July issue) Fig. 2 should read Fig. 3 and Fig. 3 should read Fig. 2. Spindle #4 was used in the test for viscosity. In Table II (page 27) aluminum acrylate should read aluminum acylate.

The author continues his random reflections on various aspects of the paint industry. The opinions expressed in this column are his alone and do not necessarily reflect those of this publication.

Temporary Floor Finishes

IN recent months, polymer emulsions have been finding their way into temporary floor finishes. One estimate has it that 30 to 40 million pounds of latices are now used for such compositions, 80% to 90% being polystyrene, the remainder acrylic. Light color, toughness, and low cost are cited as major advantages.

During application studies, interesting findings were made on the structure of these films. Some may be applicable to areas of paint formulation.

In the February 1958 issue of *Soap and Chemical Specialties*, R. M. Avery, Jr. and L. H. Perry, in a paper entitled "The Structure of Floor Finishes Based on Polystyrene Emulsions," reported as follows:

"The polystyrene type polymers are not film forming and require the addition of plasticizers to render them useful in floor finishes. However as practical systems were

Phil Heiberger

worked out, only unexpectedly small amounts of plasticizers were required and some of the primary plasticizers for polystyrene did not work well at all. On the other hand, some materials that were not true plasticizers did work well. Also noted was the fact that floor finishes gave good films shortly after mixing. This is unusual, for complete absorption of plasticizer by a polymer in latex form normally required several hours. These results, as well as other observations, led us to believe that floor finishes made with polystyrene latices were actually dispersions of the polymer particles in a film-forming matrix containing wax, resin, plasticizer, and emulsifiers. This theory could have a very practical significance both in the design of new polymers and in the formulation of finishes. In order to investigate it further we went to the electron microscope as a means of studying the very fine particles that are involved.

"On the basis of these electron microscope studies we feel more certain than ever that the polymer particles in floor finishes are dispersed in a film forming matrix. The particles are relatively unaffected by the plasticizers and do not form amorphous mixtures with other ingredients of the finish. Because of this, the polymer particles retain their hardness and

toughness which in turn makes a longer lasting floor finish. Since only the matrix is plasticized, there is a much greater choice of plasticizers including such materials as fatty acids, film-forming polymers and regular ester types. Further, these various materials may be added at practically any stage of the process that is desired. Both of these facts give a much a greater latitude to the floor finish chemist than was originally expected."

Evaluating Floor Finishes

ANOTHER group of workers, Fuld et al., reported in the April 1958 issue of *Soap And Chemical Specialties*, in a paper entitled "New Radioisotopic Wear Evaluation of Floor Finishes," on their efforts to evaluate floor finishes with the use of radioisotopes.

Wear testing of various floor finishes was, of course, largely subjective until the development of radioactive methods, such as the following: Carbon-14 is added to the fatty acid used as an emulsifier of the finish. The product is then applied to a floor surface and the radioactivity is read at various intervals with an end window Geiger-Muller counter and amplifier. This technique has several disadvantages; especially notable are the high cost of Carbon-14 and the required counting equipment and the long half-life of Carbon-14.

Fuld et al., however, describe in their paper an improved method, utilizing a short half-life beta emitting isotope, Calcium-45, and a routine survey meter. Approximately five microcuries of Calcium-45 chloride were added to one quart of floor finish and applied to a clear test area of light colored rubber tile six feet square. The finish was spread as evenly as possible, dried overnight, and subjected to foot traffic. Weekly sampling was arranged. The adjacent area was covered with a non-radioactive layer of the same finish in order to analyze for radioactive carryover which would indicate tracking tendencies.

Another technique was utilized for comparison of one phase of wear properties. A piece of light colored vinyl tile, five inches square, was cleaned and coated with solvent double dye. Then a known thickness of finish was applied and the panel allowed to dry. Using the Taber Abrader with a CS-8 wheel with an endpoint of visual removal of dye from about 50% of the abraded track, the wax base was compared with the polymer base films. The waxes gave a higher apparent resistance.

It is important to realize, state Fuld et al., that if wear comparisons are to be made between totally different products, the radioactive method, rather than the abrasion method, should be used. But if wear comparisons are to be made between products of similar base, then the quicker, more economical abrasion method will serve just as well.

Edible Paints

WITH space travel "just around the corner," *Missiles And Rockets*, *3*, 109 (1958) speculates that if food value can be put into a packaging film, it would become a favorite packaging material for space shipments, since every ounce of material taken on a space flight must be made as useful as possible. Thus, packages for food and supplies should be made of edible "vitamin-loaded chemical films."

Fly Paint

YOU wouldn't think entomologists would be wrinkling their brows puzzling over paint problems, but evidently such is the case. What's more, they've come up with solutions, too! And, strange as it may seem, a market does exist for fly paint.

A group of workers at the East African Trypanosomiasis Research Organization have described some fine paint work in an article entitled "Detection of Tstetse Fly at Night," which appeared in *Nature*, *181*, 1354 (1958).

In order to locate tstetse flies at night (to learn about their habits and resting places), they were marked with paints which fluoresce in ultraviolet light. The method was inconvenient because the equipment required to produce ultra violet light is rather cumbersome under field conditions. It was considered that the reflecting paints used for road signs might be equally effective for marking the insects since it would require only light in the ordinary visual range such as can be provided by an electric torch.

Aerosol forms were tried out but they fouled the wings and other organs of the insect. Finally the glass beads were dispersed in a thin varnish of shellac in alcohol or a gum acacia solution with a trace of detergent. The films were marked on the thorax with spots 2 mm. in diameter. The results were quite effective yielding a brilliant reflection with ordinary torches.

In a companion paper, "Use of of Reflecting Paints for Locating Tstetse Fly at Night," the authors recommended this method for other insects, perhaps even the mosquito.

Where There's Smoke

RESEARCHERS having trouble reproducing certain reactions —take heart. A new explanation for such shortcomings is now available.

Apparently, there is a sufficient concentration of free radicals in cigarette smoke to act as a carcinogenic agent. Therefore, there should be a sufficient number of free radicals to influence drying studies or free radical polymerizations.

In *Nature*, *181*, 1003-4 (1958), authors M. J. Lyons, J. F. Graham, et al., have determined the concentration of free radicals in cigarette smoke and described a series of experiments using electron resonance spectrometer.

This may constitute a further justification for forbidding smoking in laboratories.

Free Radical Reactions

NOT all free radical reactions are bad. According to U. S. Patent 2,818,414 (assigned to W. E. Vaughan, F. F. Rust, and E. R. Bell), free radical reactions involving the abstraction of hydrogen from a material containing labile hydrogen, e.g., dehydrogenation, dehydrodimerization, or dehydropolymerization reactions and various oxidation reactions, are conducted by heating the material containing the labile hydrogen with vaporized hydrogen peroxide at temperatures above 400°C. for short periods. Afterwards, the desired product is recovered.

NEWS

Union Carbide Builds Service Laboratory

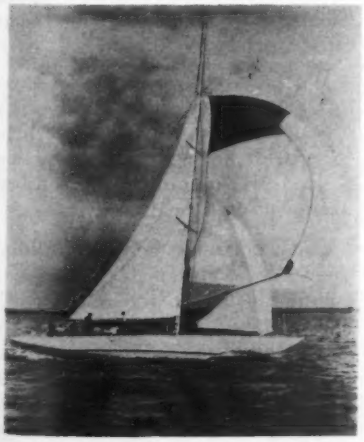
The Union Carbide Corp. has started construction on a technical service laboratory at Eastview, near Tarrytown, N. Y.

It is anticipated that the laboratory will be completed and ready for occupancy by late 1959.

The laboratory will be a three-story building located on a 280-acre tract. The main building, with a total floor area of 85,000 square feet, will house 53 individual laboratory units. These facilities will be complimented by a mechanical test building in which pilot plant operations will be conducted.

At the new laboratory, a broader range of technical studies will be undertaken to help customers develop new processes and new products, to redesign existing products, and to provide information on methods and equipment for safe handling, use, and bulk storage of chemicals.

The customer service programs will embrace the development of technical data to serve some two dozen major industries and markets.



MARINE FINISH: A specially formulated racing finish based on Ciba Araldite Epoxy Resins was selected for the recently launched America Cup Defender, *Columbia*. Finish exhibits excellent adhesion to wood and provides good resistance to salt-water.

PAINT PLANT OPENS: The Tousey Varnish Co. has recently opened its new Quad-Cities division plant in East Moline, Ill. The latest in processing equipment and material handling equipment have been installed in the 20,000 square feet allotted for manufacturing and shipping. The new Tousey addition will manufacture approximately 1,000,000 gallons of paint per year.

ASTM Elects National Officers For 1958-59

The new national officers for the American Society for Testing Materials were elected at the Society's 61st annual meeting held in Boston, Mass., June 22-27.

The list of officers elected are as follows:

Kenneth B. Woods, head, school of civil engineering and director, joint highway research project, Purdue University — *President*; **A. Allan Bates,** vice president of research and development, Portland Cement Assn. — *Vice President*; and **Frank L. LaQue,** vice president & manager, development and research division, International Nickel Co., Inc.— *Senior Vice President.*

Elected for three-year terms on the board of directors were the following:

Paul A. Archibald, Baldwin-Lima-Hamilton Corp.; **William L. Fink,** Alcoa Research Laboratories; **Harry M. Hancock,** Atlantic Refining Co.; **Lawrence A. O'Leary,** W. P. Fuller & Co.; and **Alfred C. Weber,** E. I. Du Pont de Nemours & Co., Inc.

•

New Sales Offices

General Mills' chemical division has opened five new sales and service offices, it has been announced.

The five new offices are located in Boston, Philadelphia, Houston, Los Angeles, and San Francisco.

Diffraction School

The 31st Norelco X-ray diffraction school for chemists, production supervisors, and others interested in rapid, accurate methods of analysis, will be held at the Sir Francis Drake Hotel, San Francisco, during the week of September 8-12, 1958.

Registration for the week-long course will be limited to 125 for the first four days, and to 150 on Friday, the day devoted to actual application problems.

Monday through Thursday, the sessions involve extensive classroom and laboratory work.

Basic subjects covered include X-ray diffraction, diffractometry and spectrography. Also, there will be discussions on electron microscopy and electron diffraction.

There is no registration fee. Norelco recommends that reservations be made at the earliest possible date.

•

Ferro Sales Up

Ferro Corp. sales for the second quarter of this year were $14,081,000, up nine per cent from the first quarter, and earnings were $413,000, or $.58 on 719,962 shares, up nearly 12 per cent from the first quarter.

For the six months ended June, $783,000 was earned, equal to $1.09 per share on sales of $26,968,000.

NEWS

Federation Planning For Paint Show & Meeting

The Paint Industries' Show of 1958, to be held in the Arena of the Cleveland Public Auditorium on October 6, 7, and 8, promises to be the biggest show in the 23-year history of the annual exhibit which is held concurrently with the Annual Meeting of the Federation of Paint and Varnish Production Clubs.

One hundred and forty-nine exhibit spaces, occupied by 92 exhibitors, will bring to Federation members and guests the very latest developments in equipment and raw materials, the most recent technological information, and an opportunity to meet and talk to the technical personnel of suppliers.

Many former exhibitors will again participate. The four pioneers, Anderson-Prichard Oil Corp., Bakelite Co., Columbian Carbon Co., and Rohm & Haas Co., will be in the show for the 23rd time. New exhibitors to be seen include Air Reduction Chemical Co., Amoco Chemicals Corp., the Elastomers Division of the Du Pont Co., General Aniline & Film Corp., Great Lakes Carbon Co., Imperial Paper & Color Corp., and H. Kohnstamm & Co., Inc.

The program for the 36th Annual Meeting will set a new high in technological excellence. The Joseph J. Mattiello Memorial Lecture will be presented by Dr. Eugene G. Rochow, professor of inorganic chemistry at Harvard University. The Keynote Address will be presented by Dr. Lincoln R. Thiesmeyer, president of the Pulp & Paper Institute of Canada.

Panel discussions, technical papers, and a detailed report of the Federation's Paint Research Institute will round out the program.

This year the Paint Industries' Show takes on new importance. The competive situation in the paint industry is probably greater at this time than it has been for many years and the necessity of keeping abreast of developments in manufacturing equipment and raw materials is most pressing. New raw materials to open new markets and new and better application of materials previously used must be studied, evaluated, and discussed with the key technical personnel of suppliers.

New Ethoxylation Unit

A new ethoxylation unit has been put on stream by the chemical division of Armour & Co.

The new unit will assure increased product availability, better service, a more complete product line, as well as price reduction. This unit is located in the chemical plant at McCook, Ill.

The etho-chemicals, the term used by Armour for its ethoxylated aliphatic organics, include these trade marked products: Ethofats, Ethoduomeens, Ethomids, Ethomeens, and the newest addition to the line, Ethoquads.

These chemicals are made by ethoxylating respectively — fatty acids, diamines, amides, amines, and quaternary ammonium salts.

They have applications as emulsifiers, detergents, wetting agents, dispersants, and suspending agents.

Holland Expands

Plans for expanded production of color intermediates have been announced by the Holland Color & Chemical Co., subsidiary of Chemetron Corp.

Work is now underway on a $75,000 addition to the firm's production plant in Holland Mich. to provide for volume production of Red 2B Amine, Para Toluidine Meta Sulfonic Acid, and R-Salt.

Rid 2B Amine is a major component of Permanent Red 2B, a commonly used color pigment which has outstanding bleed-resistance characteristics, and PTMSA is the major component of Lithol Rubine, one of the older organic red pigments in the commercial color industry.

The three new intermediates will be produced for the firm's own use and will also be sold commercially.

designed for confidence **Picco** resins

Trust is warranted in Picco Resins. Carefully manufactured in large quantities, **Picco Resins** assure uniformity and high quality.

PENNSYLVANIA INDUSTRIAL CHEMICAL CORPORATION
Clairton, Penna.

WAREHOUSE

(*From page 43*)

veyor operator sends all the trays from the marshalling lines off on to a transfer conveyor. This takes the trays to storage loops in the roof of the building where they circulate (rather like the system of stacking aircraft waiting to land on a crowded airport) while awaiting checking and packing operations.

When their turn comes, the trays come down to the checkers who unload the cans on to a roller track. The order is then packed in cartons unless it is for local delivery. (See Figure 6)

After packing, the completed orders are taken, when the vehicles are ready, on slat conveyors to the loading bays. Here, by operating push-button controls, the operator can extend the conveyors out into the waiting vehicles.

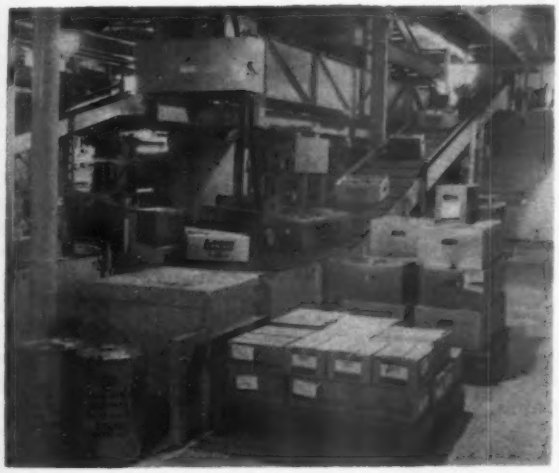


Figure 6. Packaged paints from the ground floor have been taken from one of the numbered locations and put on the slat conveyor on which they pass up the elevator to the shipping truck.

The results claimed for this warehousing system are outstandingly good. Storage capacity of building is up from 7 gallons per square foot of area to 30 gallongs of paint. The turn-round of orders, which is so vital for competitive selling has been slashed from 24 hours to as little as 11½ hours. It is also claimed that the labor force of 120 men and women (divided into 4 shifts) represents a saving of 15% in wages alone. The exact cost of the new building and plant equipment has not been disclosed, but in spite of this, the capital cost per gallon of paint stored is said to be only 75% of the previously available cost figures. The use of conveyors with loading and unloading stations, with transfer machines and remote control, puts this method of mechanical handling in the semi-automation class. The design engineers and suppliers of equipment have certainly set an example in solving the three main problems, which are always present in storage and mechanical handling for dispatch, namely: To save space, to make movement of goods automatic, and to speed up dispatch of orders.

"Tailored" Odor Treatment Gives You Odor-Free Paint For Less Than 1c More Per Gallon

You can meet the consumer demand for odor-free paints of every type—standard, acrylic, latex-based, polyvinyl acetate or alkyd—at a fraction of a cent per gallon for effective VANDOR odor treatment.

No two paint formulas are exactly alike, and no stock odor material suits them all. VANDOR odor control materials are tailored to match your specific paint formulation. Balanced odor components are employed to blend with each volatile painty off-odor —to mask it completely to achieve a neutral effect during use. Then they're gone when the job is done, leaving no "perfumey" odor behind.

For a recommendation and samples, send a quart of your paint. At no charge, our laboratory will submit recommendations, cost analysis and samples of a VANDOR odor control material tailored to suit your particular paint.

VANDOR

odor control materials

van Ameringen-Haebler, Inc.
521 West 57th Street
New York 19, N. Y.

PRODUCTION TIPS

AIR MOTORED AGITATORS SHOW VERSATILITY IN SMALL PRODUCTION BATCHES.

PNEUMIX agitators are claimed to safely mix—in laboratory and production—all types of materials from water-thin to heavy substances—flammables, acids, etc. —even in explosive atmospheres. Explosion hazards are removed because compressed air operation eliminates dangerous sparking.

These new agitators are easier to handle. The heaviest direct drive unit weighs only 45 pounds—and that's a real advantage in batch mixing. They are only 1/4 to 1/3 as heavy as an electric mixer of equal capacity.

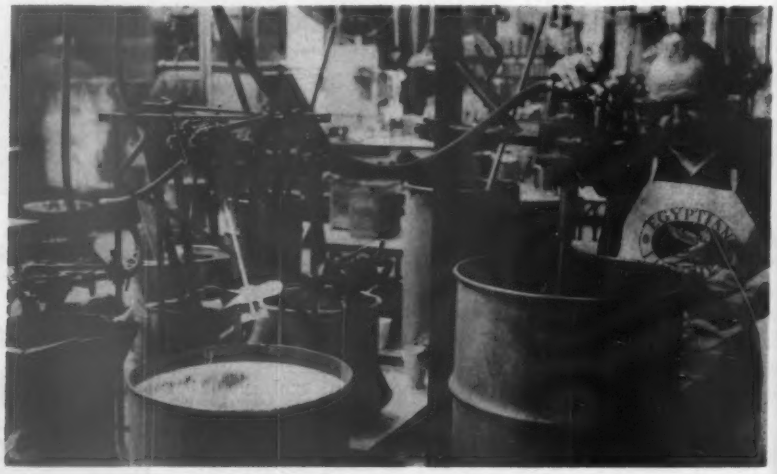
Construction of these agitators is rugged yet so simplified that any RPM up to 3200, without load, is controlled and maintained by a single accessible air throttle. In addition, torque is controlled; providing an increased torque with decreased RPM.

According to the manufacturers, these agitators cannot overheat. They cannot burn out. They will run efficiently under all conditions, including high temperatures, abrasive or corrosive atmospheres and are not affected by overload. If stalled because of overload, the air is automatically shut off without damage to the unit.

Maintenance is said to be easy. Only an occasional drop of oil is required. Muffled exhaust insures quiet operation. They are recommended for stirring paints, varnishes, enamels, synthetics, for agitating pyroxylin lacquers of heavy viscosity, and for mixing shellac with alcohol. The agitators are also used in paint spray installations—driving exhaust fans in spray booths, turntables, permanently installed agitators in paint drums—for unit heating—agitating paint which has settled out prior to use.

For full details, write to Eclipse Air Brush Co., Newark 7, N. J.

Shown here is the use of air agitators in producing laboratory samples and experimental batches.



This photograph shows how air agitators can be effectively used on small production batches.

UNIQUE INVOICE ACCOUNTING PLAN

Hanna Paint finds plan eliminates daily posting, simplifies monthly statements, provides quick check on delinquents, and gives accurate sales records.

By
Eugene T. Lyda*

HANNA Paint Manufacturing Company maintains headquarters in Colombus, Ohio with four manufacturing plants in four different states which enable us to give our dealers fast and efficient service. Five strategic factory locations, including one foreign location plus many branches and warehouses assure our customers speedy service.

In its 70 years of operation, Hanna Paint has continuously improved its laboratories, plant facilities and office procedures. We are ever alert to newer and better office systems to keep pace with laboratory and plant progress. We pride ourselves on the continued dependable quality of our paints and carry this pride into all phases of our operation.

In addition to keeping all records for the factory and warehouse here in Birmingham, we handle the accounts receivable for the Orlando (Florida) branch warehouse. They send us, by mail, all the invoices, sales tickets and sales analysis sheets at the close of each day.

Clerk posts to the SUTAP system by merely dropping the invoice into the customer's pocket in the Kolect-A-Matic tray housed in insulated file, which assures 24-hour point-of-use protection against fire and theft.

*Assistant Treasurer, Hanna Paint Manufacturing Co., Birmingham, Ala.

Stacked pails of paint ready for shipment.

We had for many years been using a machine posting method making daily postings and keeping a cumbersom ledger, until it became so old and noisy that we could barely hear each other. We decided we would have to get a new unit. However, further study indicated that we could do away with the machine entirely by replacing it with the a Remington Rand Simplified Unit Invoice Accounting Plan (SUIAP). In addition to the cost factor there were other advantages to be gained.

We installed the SUIAP plan in two Kolect-A-Matic Trays housed in a two-drawer insulated Safe-File. Each customer is assigned an individual account pocket which is clearly identified by name at the top edge of the visible index card. The customer's credit history card gives us all necessary information—the type of account, special terms, any special information needed and an accurate, up to date sales record—in one location.

When a sales order is received in the shipping room, it is written up in triplicate. The original (white) slip comes to the office, the second (yellow) copy goes to the customer with the bill of lading, and the third (pink) is filed in numerical order.

The white slip, which is returned to the billing department, is then priced and extended and an invoice is prepared from it. These then go to the Sales Analysis Department, where a daily sales analysis report is created.

Our next step, "daily posting", merely consists of dropping the white slip and invoice into the proper Kolect-A-Matic pocket in which all unpaid invoices of that customer are to be found. At the end of the month a small statement is inserted in the adding machine and the amounts from the invoices are totalled, balances added and credits deducted. The last amount printed is the total due. That's all there is to the preparation of monthly statements.

At this time, too, we check sales slips with the sales analysis report and post the totals on the customer's record card. With this routine, we have incorporated a sales record with the credit history, something we did not have before.

Five-drawer Kompakt file replaces a conventional four-drawer file, allowing additional 25% filing space in the same physical area.

Imprinted on the visible edge of the 6½" x 10" master card, is a 12-month scale on the right half of the edge, and four numbered boxes on the left portion. A movable Graph-A-Matic signal is set to indicate the month of the oldest unpaid invoice. This enables us to see, by glancing at the top edges the status of the account. Delinquent accounts stand out prominently by the position of the signal, and we determine which accounts need collection attention without having to go through the entire file.

For our delinquencies, we have a series of four collection letters. As each letter is sent, a signal is set on a number indicating which of the series of letters has been sent. When the signal is on the fourth and last box, we know that the account is in the hands of our legal counsel.

After an account is paid, the invoices are removed from the customer's pocket and transferred to the paid invoice file retained in two five-drawer Kompakt files. Each of these units provides us with 25 percent more filing space than the four-drawer files which previously occupied the same space. With our crowded office, this is an important factor. Variadex, a color-coding system for filing alphabetically, gives us a speedier and more accurate procedure for locating accounts in our permanent files.

Through the new system we have eliminated the daily posting, and simplified the sending of monthly statements. We now have a quick visual check on delinquent accounts, and an accurate monthly and yearly sales record—with a potential eight-year record on each side of the customer's record card.

We no longer have a maintenance problem, as we did with our old machine, and we have 24-hour point-of-use protection of our valuable records in the insulated Safe-File. Finally, these advantages have been gained for one-third the cost of a new machine.

Hanna technician testing batch before filling operations.

TECHNICAL Bulletins

SPECTROPHOTOMETERS

A 24-page brochure on the Infracord double beam infrared spectrophotometer has been published by the Instrument Division, Perkin-Elmer Corp., Dept. PVP, Norwalk, Conn.

The brochure describes what infrared is and how it is used for the identification of unknowns, qualitative and quantitative analysis, product control, and as a permanent step-by-step record of a chemist's work.

The design, specifications, and performance of the Infracord are thoroughly described. Typical spectra illustrate the performance characteristics.

Descriptions of a complete line of accessories are also included.

LABORATORY INSTRUMENTS

A 10-page 1958 catalog describing the complete line of Servall laboratory instruments has been made available by Ivan Sorvall, Inc., Dept. PVP, Norwalk, Conn.

The catalog also includes descriptions of the firm's line of refrigerated centrifuges, enclosed and automatic superspeed centrifuges with versatile rotor combinations including an 8-tube continuous flow system, and virus, field aligning horizontal and high-speed large capacity rotors.

Also featured are high-speed homogenizers, magnetic stirrers and moisture testers.

REFINISHED WALL PANELS

A recommended revision of Commercial Standard CS176-51, Prefinished Wall Panels, has been released by the Commodity Standards Division, Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D.C., for industry consideration and acceptance.

The revision, designated TS-5396, establishes definite criteria of physical requirements which should be possessed by the base material and the finish coating. It also presents a basis on which performance guarantees may be made by the manufacturer.

PLASTIC TANKS

A brochure giving full information on Fiberglass Plastic Tanks, including prices and chemical resistance tables, has been made available by Jones & Hunt, Inc., Dept. PVP, 73 Emerson Ave., Gloucester, Mass.

Also outlined are the physical properties, sanitation characteristics, and versatility of these tanks.

ODOR-METER

A brochure describing the development of an odor-metering apparatus and techniques for its application to industrial odor-control problems has been released by Hemeon Associates, Dept. PVP, 121 Meyran Ave., Pittsburgh 13, Pa.

BELT CONVEYORS

An illustrated four-page bulletin with details on the new series "L-M" horizontal and inclined belt conveyors has been published by the E. W. Buschman Co., Dept. PVP, Clifton & Spring Grove Avenues, Cincinnati 32, Ohio.

Designated as Catalog 80, it describes the complete line of the firm's "L-M" stock components, as well as detailing how they can be customized to meet the exact requirements of any store, warehouse, or factory for a light-medium conveyor system.

R-B-H
TRANSPARENTS.....As modern as rocketry
The brilliance, lightfastness and bleed-resistance of R-B-H transparents have made them a formulator's favorite for twenty-five years. They provide the benefits of pigments with the transparency of dyes for 1958's eye-catching finishes.
R-B-H dispersions
INTERCHEMICAL CORPORATION
Color & Chemicals Division
HAWTHORNE, New Jersey

Included are complete dimensional diagrams of typical cross sections for both inclined and horizontal applications. Specifications and installation views are also included.

CAN SELECTION

An illustrated, two-page bulletin that helps the packager of dry, semi-liquid, or liquid products to select the proper type of can for these products has been issued by George D. Ellis & Sons, Inc., Dept. PVP, American & Luzerne Sts., Philadelphia 40, Pa.

The bulletin, designated Product Memo #112, shows 38 different cans, broken down into 3 different categories: round cans, round cornered square cans, and round cornered rectangular cans.

Diameters, minimum and maximum body heights, and types of slip conveyors are given in a chart on round cans; base-dimensions, body heights, and types of covers are given in separate charts for the other types of cans.

MATERIALS HANDLING TRUCKS

Potential purchasers of low-lift and high-lift electric materials handling trucks can now impartially evaluate different makes and models through a comparison chart which has been made available by Lewis-Shepard Products, Inc., Dept. R8-13, Dept. PVP, 125 Walnut St., Watertown 72, Mass.

The chart lists some 30 different points of comparison for both high-lift and low-lift "walkies."

Such categories as traction speeds, location of operating controls, type of brakes, mast construction, hydraulic system, and maintenance features are listed on the chart.

ALIPHATIC CHEMICALS

A 52-page catalog of the firm's line of aliphatic chemicals has been made available by the Chemical Products Division, Archer-Daniels-Midland Co., Dept. PVP, Box 839, Minneapolis 40, Minn.

Included in the booklet are test data on olefins, hydrocarbons, fatty alcohols, hydrogenated and vegetable fatty acids, glycerides, and sperm oil products.

The catalog also contains a commercial presentation of gas chromatographic composition data on olefins hydrocarbons, fatty alcohhls, and hydrogenated fatty acids.

Solubility, compatibility, and physical constants charts are given for the various products.

LATEX COMPOUNDING

A data report on a latex compounding ingredient, Modicol S, has been made available by Protective Coatings Dept., Nopco Chemical Co., Dept. PVP, Harrison, N.J.

Applications and properties are discussed in detail.

FLASH POINT TESTER

A four-page bulletin on the new time saving Automatic Flash Point Tester, duplicating ASTM D56 results, has been made available.

Precision Scientific Co., Dept. PVP, 3737 West Cortland, Chicago, Ill.

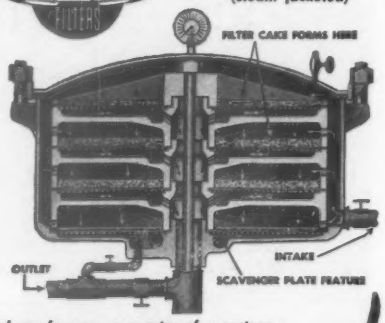
Remove "Fish Eyes", Skins, Incidental Solids and Semi-Solids from Varnish and Lacquer with . . . .

SPARKLER FILTERS

Model 18-S-12 Varnish Filter (steam jacketed)

Many varnish makers now use Sparkler Filters to clarify varnish, lacquers, and other clear liquids. The brilliance and polish obtained by filtering with Sparkler Filters is far superior to results obtained with other methods of clarifying paint products.

Our engineers are ready to give personal attention to your problems.



SPARKLER

MANUFACTURING COMPANY

MUNDELFIN, ILL.

Makers of fine filtration installations for industrial use for over a quarter of a century

NO MAGIC . . . JUST USE

MICA

WATERGROUND AND MICRO

FOR DURABLE and BETTER PAINTS

A small amount of Mica goes a long way toward increasing the durability of the paint film. Be sure to use this 100%-flaky extender pigment.

50 YEARS OF PRODUCING FINELY GROUND MICA

The English Mica Co.

STERLING BUILDING STAMFORD, CONN

BOX CLOSURE METHODS

"A Guide to Better Closures," specially prepared for users of fibreboard boxes and packages, has been published by Acme Steel Products Division, Acme Steel Co., Dept. PVP, 135th and Perry Ave., Chicago 27, Ill.

The brochure is intended as a guide for the evaluation of methods currently in use to effect economies and stepped-up production in the closure of fibreboard boxes. It contains information on closure methods, the facts of which have been taken from user surveys, published works, and manufacturers' statements.

Various closure methods are discussed along with the advantages and disadvantages of each.

STANDARDIZED LIGHTING

"Can You Match Colors Over The Phone—Or By Mail?" is the title of a four-page brochure which has been published by the Macbeth Daylighting Corp., Dept. PVP, P.O. Box 950, Newburgh, N.Y.

Designed to point out the advantages of standardized lighting for color viewing between customer and plant, within the plant, and between plants.

The brochure is an aid for color matching, color evaluation, or inspection problems.

Also outlined are some of the firm's newer equipment.

CODER-PRINTER

Features of the new, automatic "Top 'n' Bottom Coder-Printer" are described in a catalog sheet made available by Cozzone Marking Co., Dept. PVP, 18 Nuttman St., Newark 1, N.J.

The sheet includes diagrams, photographs, and performance data. Also included are height and width specifications and drawings locating and describing the machines essential components.

RESIN EMULSIONS

The Union Carbide Chemicals Co., Dept. PVP, 30 E. 42nd St., New York 17, N.Y. has published a seven-page bulletin on "Chemicals for Resin Emulsions."

Included in the contents are preparation of base latex, chemical aids in formulating finished latex paints, and a list of references.

VINYLPYRROLIDONE

A 25-page brochure on the applications of vinylpyrrolidone, illustrated with technical tables and charts, has been made available by Antara Chemicals, Dept. PVP, 435 Hudson St., New York 14, N.Y.

The brochure details copolymerization of vinylpyrrolidone with other monomers for a wide variety of products such as adhesives, coatings, and finishes.

CROTONIC ACID

Crotonic acid, its properties, reactions, and applications are described in a brochure published by Eastman Chemical Products, Inc., Dept. PVP, Kingsport, Tenn.

The brochure, TDR #A-101, outlines numerous reactions of crotonic acid involving its double bond and its carboxyl group.

A comprehensive bibliography is also included.

SOY PROTEINS

Archer-Daniels-Midland Co., Dept. PVP, 2795 Sharon Road, Cincinnati 41, Ohio, has published technical bulletins on three high purity isolated soy proteins for industrial use.

The bulletins cover the firm's Adpro 112, Adpro 220, and Adpro 410.

They include specifications, uses, preparation of various dispersions and solutions, viscosity data, preservatives, and compatible materials.

now! the most important new can development of the century!

FEIN'S NEW "SHELF-LIFE"

2 GALLON LUG COVER STEEL PAILS

INCREASE SHELF-LIFE BY 300%
New filling line cuts down air space!

New Fill Mark
Old Fill Line

Now... a great new triumph in pail development! The new "SHELF-LIFE" pail designed by Fein's engineering and research departments with the close cooperation of over thirty of the paint chemists associated with leading manufacturers. Tests run by your chemists have proven that the use of this new pail will increase the resistance to skinning of alkyd, odorless, and other paints prone to skinning at least 300% as compared to previously manufactured 2 Gallon pails. Fein's new "SHELF-LIFE" pails raise the filling line to reduce air space... and keep your profits from "skinning" away!

FEIN'S TIN CAN CO., INC.
50th STREET & 1st AVENUE, BROOKLYN 32, N. Y.
Telephone: STerling 8-2300

PHILADELPHIA AREA OFFICE ... The Benson, Jenkintown, Pa., WAverly 4-8022

SALES OFFICES Baltimore, Cleveland, Cincinnati, Boston, Columbus, Miami, Jacksonville, Chicago, Detroit, St. Louis, Philadelphia, Pittsburgh and Smith Can Company in Atlanta, Georgia.

AFFILIATED FIRMS

ATLAS CAN CORP.	Brooklyn, New York
PEERLESS CAN CORP.	Brooklyn, New York
COMMERCIAL CAN CORP.	Newark, New Jersey
STANDARD CAN CORP.	Leetsdale, Phila., Pa.

WATER GROUND
MICA
ALSIBRONZ
EXTENDER PIGMENTS
for:
PRIMER-SEALERS
HOUSE PAINTS
LATEX-EMULSIONS
FRANKLIN MINERAL PRODUCTS
COMPANY
FRANKLIN, NORTH CAROLINA
INCORPORATED 1926
Agents in Principal Cities

CLASSIFIED ADVERTISEMENTS

Rates: $.20 per word, except those seeking employment, for which rate is $.10 per word. Minimum: ten words. Address all replies to Box Number, c/o Paint and Varnish Production, 855 Avenue of the Americas, New York 1, New York.

CHEMIST WANTED

Medium size manufacturer (no trade sales goods) of broad line of chemical-resistant coatings looks for CHEMIST for Paint Plant Laboratory. Excellent opportunity for advancement, if you possess the following qualifications:

Age—26-35
B.S. in Chemistry (minimum)
2-5 years' experience in paint laboratory.

Send resume, including salary requirements, to Box 858.

LICENSING

Top Italian chemical firm is interested in obtaining licensing arrangement for producing iron oxide reds, blacks and browns. Write Box 758.

ADIPIC ACID

National Aniline Division, Allied Chemical Corp., Dept. PVP, 40 Rector Street, New York 6, N.Y., has released Technical Bulletin I-12R.

Entitled "Adipic Acid," the bulletin has been completely revised and expanded to include comprehensive current information on this reactive dicarboxylic acid.

This revised edition comprises 36 pages of basic data. Included are physical properties, chemical properties and reactions, suggested uses, and a list of 271 literature references.

MIXING EQUIPMENT

A bulletin outlining some of the firm's mixing and grinding equipment has been made available by Paul O. Abbé, Inc., Dept. PVP, 141 Center Ave., Little Falls, N.J.

The bulletin lists the construction features, application, and properties for ball and pebble mills, mass and paste mixers, rota-cone blenders and dryers, drum rollers and tumblers, jar mills, ribbon mixers, and lump breakers.

TIERING TRUCK

The new four directional electric tiering truck is described in a bulletin now being offered by the Raymond Corp., Dept. PVP, 345-168 Madison St., Greene, N.Y.

Complete specifications, suggested applications, and photos showing the truck in use are included in the literature.

PIGMENTS

A booklet on "Lead & Zinc Pigments for the Paint Industry" has been made available by the Eagle-Picher Co., Chemical Division, Dept. PVP, Cincinnati 1, Ohio.

The bulletin contains general information, specifications, specific product data, and particle size distribution for a wide variety of the firm's pigments.

AGITATING EQUIPMENT

A 16-page Pneumix catalog has been made available by Eclipse Air Brush Co., Dept. PVP, 390 Park Ave., Newark 7, N.J.

The booklet introduces many new items which have been added to the firm's line of laboratory and production agitators.

PLANETARY CAN MIXERS

A four-page bulletin has been issued by Charles Ross & Son Co., Inc., Dept. PVP, 148-156 Classon Ave., Brooklyn 5, N. Y., which illustrates and describes the double planetary changeable can mixers offered for mixing all types of light or heavy paste materials.

The brochure, #5A, shows 14 different size mixers available from the small one gallon laboratory size to the 150 gallon large production size.

The features of the mixer are fully outlined. Complete specification charts are also included.

FIRE EXTINGUISHING

The "F.E.M.A. Handbook of Safety Codes" has been made available by the Fire Equipment Manufacturers' Association, Inc., Dept. PVP, Suite 759, One Gateway Center, Pittsburgh 22, Pa.

The handbook outlines the various procedures for maintaining, protecting, recharging, and in-specting fire extinguishing equipment commonly used throughout the paint industry.

The 42-page brochure presents both mandatory and recommended procedures to be followed to assure long life and efficient service from portable fire extinguishers, carbon dioxide systems, standpipe and inside hose systems, and fixed foam systems.

PALLETLESS HANDLING

How an appliance manufacturer was able to meet its fluctuating production schedule through the conversion to a fleet of electric industrial trucks is the subject of a new case history bulletin available from Lewis-Shepard Products, Inc., 125 Walnut Street, Watertown 72, Mass.

The four-page presentation, designated Case History Bulletin 362-1, is fully illustrated with a series of action photos taken right in the plant.

Among the features is a pictorial explanation of how the company applied the principle of palletless handling.

Such applications as handling going vehicles are also described.

CALENDAR OF EVENTS

Sept. 7-12. Meeting of the ACS, Division of Paint, Plastics & Printing Ink Chemistry, Chicago, Ill.

Oct. 5-9. 36th Annual Meeting and 23rd Paint Industries' Show of Federation of Paint & Varnish Production Clubs, Cleveland Public Auditorium, Cleveland, Ohio.

Oct. 27-29. Seventy-first annual convention of the National Paint, Varnish & Lacquer Assn., Shoreham Hotel, Washington, D. C.

Production Club Meetings

Baltimore, 2nd Friday, Park Plaza Hotel.

Chicago, 1st Monday, Furniture Mart.

C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April, Suttmilers.
Columbus — Jan., June, Sept., Fort Hayes Hotel.

Cleveland 3rd Friday, Harvey Restaurant.

Dallas, 1st Thursday after 2nd Monday, Melrose Hotel.

Detroit, 4th Tuesday, Rackham Building.

Golden Gate, 3rd Monday, Sabella's Restaurant, San Francisco.

Houston, Monday prior 2nd Tuesday, Ship Ahoy Restaurant.

Kansas City, 2nd Thursday, Pickwick Hotel.

Los Angeles, 2nd Wednesday, Scully's Cafe.

Louisville, 3rd Wednesday, Seelbach Hotel.

Montreal, 1st Wednesday, Queen's Hotel.

New England, 3rd Thursday, University Club, Boston.

New York, 1st Thursday, Brass Rail, 100 Park Ave.

Northwestern, 1st Friday, St. Paul Town and Country Club.

Pacific Northwest, 3rd Thursday, Washington Athletic Club, Seattle, Wash.

Philadelphia, 3rd Wednesday, Philadelphia Rifle Club.

Pittsburgh, 1st Monday, Gateway Plaza, Bldg. 2.

Rocky Mountain, 2nd Wednesday, Republican Club, Denver, Colo.

St. Louis, 3rd Tuesday, Kings-Way Hotel.

Southern, Annual Meetings Only.

Toronto, 3rd Monday, Oak Room, Union Station.

Western New York, 1st Monday, 40-8 Club, Buffalo.

New Books

Supplementary List of Publications of the National Bureau of Standards, July 1, 1947 to June 30, 1957. *Published by the U. S. Department of Commerce, National Bureau of Standards, Washington 25, D. C. Price $1.50.*

This 373-page publication issued May 14, 1958, supercedes the supplement to Circular 460.

The National Bureau of Standards publications listed in this supplement include applied mathematics series, building materials and structures reports, circulars, handbooks, research papers, and miscellaneous publications.

The catalog gives a brief abstract of each paper, and also contains author and subject indexes. The procedures for purchasing the publications are outlined, and a list of depository libraries throughout the United States is included.

Mechanisms of Inorganic Reactions *By Fred Basolo and Ralph G. Pearson. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. Price $11.75.*

This book offers an up-to-date survey of current theories on the dynamic, mechanistic aspects of coordination compounds.

For the research chemist, the book offers aid in problems such as: choosing metal ions expected to give either labile or inert complexes; or selecting metal ions which have specific catalytic properties.

Fred Basolo, previously associated with Rohm & Haas, is now an associate professor of chemistry at Northwestern University, and Mr. Pearson is a professor of chemistry, also at Northwestern.

1957 ASTM Proceedings, Volume 57 *Published by the American Society for Testing Materials., 1916 Race St., Philadelphia 3, Pa. Price $12.00.*

The 1430-page volume, recording the technical accomplishments of the year, includes reports and papers together with discussion offered to the Society during the year and accepted for the *Proceedings.*

The volume includes the summary of proceedings of the ASTM 60th annual meeting and the summary of proceedings of the Philadelphia spring meeting, listing by title and author the programs for each session.

Included are records of all meetings held by the Society and its districts, information on membership gains, publications, honors, and awards. There are 66 reports of technical committees.

PAINT and VARNISH Production

SPECIAL OCTOBER CONVENTION ISSUE
*MSYAS!!

OFFERS COMPLETE COVERAGE OF THE PAINT INDUSTRY

Plus...

SPECIAL BONUS CIRCULATION AT FEDERATION AND ASSOCIATION SHOWS

AT NO EXTRA COST!!!

Featuring...

▶ **Outstanding** Multi-Page Editorial Feature on a Subject of paramount interest to Paint Manufacturers.

▶ **Listings** of Complete Show Programs, Booths and attending Supplier personnel.

▶ **100%** Coverage of Paint Manufacturers in the United States and Canada.

*Make Sure Your Ad Schedule Includes It!

MEMBER BUSINESS BPA PUBLICATIONS AUDIT, INC.

PAINT and VARNISH *Production*
Published by
POWELL MAGAZINES, INC.
also Publishers of the
"REVIEW and BUYERS' GUIDE"
855 Avenue of Americas
New York 1, N. Y. BR 9-0497

ADVERTISERS' INDEX

Alkydol Laboratories, Inc.	44
C. M. Ambrose Co.	July
American Can Co.	July
American Cyanamid Co., (Plastics & Resins)	3rd Cover
American Zinc Institute	July
American Zinc Sales Co.	20
Arizona Chemical Co.	65
Atlas Electric Devices Co.	61
Bakelite Company, A Div. of Union Carbide Corp.	July
Baker Castor Oil Co.	July
Barrett Div., Allied Chemical Corp.	30
Borg-Warner Corp., Marbon Chemical Division	66
Buhler Bros.	72
Celanese Corp. of Amer., Chemical Div.	49
Celanese Corp. of Amer., Plastics Div.	July
Ciba Co., Inc.	77
Columbian Carbon Co., (Mapico Color Unit)	45
Columbian Carbon Co. (Paint -Dispersions)	July
Commercial Solvents Corp.	26
Continental Can Co.	63
Davies Can Co.	July
Davison Chemical Co., Div. W. R. Grace & Co.	74
Deutsche Hydrierwerke GMBH	July
Diamond Alkali Co.	69
Dicalite Division, Great Lakes Carbon Corp.	July
Dow Chemical Co.	35, 36, 37
DuPont de Nemours & Co., Inc., E. I. (Electrochemicals Dept.)	July
DuPont de Nemours & Co., Inc., E. I. (Pigments Dept.)	11, 12, 13, 14
The Eagle-Picher Co.	48
Eastman Chemical Products Co., Inc.	54, 55
Emery Industries, Inc.	July
English Mica Co.	94
Fein's Tin Can Co.	95
Franklin Mineral Products Co.	96
General Dyestuff Co., General Aniline & Film Corp.	July
Georgia Kaolin Co.	July
Georgia Marble Co.	24
Glycerine Producers' Assn.	16
B. F. Goodrich Chemical Co.	July
Harshaw Chemical Co.	40
Heyden Newport Chem. Corp.	73
Herman Hockmeyer & Co.	July
Imperial Paper & Color Corp.	71
International Talc Co.	58
Jersey State Chemical Co.	15
Johns Manville Corp.	57
Kellogg & Sons Inc., Spencer	41
Kentucky Color & Chemical Co.	27
H. Kohnstamm & Co.	July
J. M. Lehmann	64
Liquid Carbonic Corp.	July
Mapico Color Unit, Columbian Carbon Corp.	45
Marbon Chemical Div., Borg-Warner Corp.	66
McDanel Refractory Porcelain Co.	82
Metasap Chemical Co.	62
Minnesota Linseed Oil Co.	18
Monsanto Chemical Co., (Plastics Div.)	8, 9
Naftone, Inc.	81
National Aniline Div., Allied Chem. Corp.	4
Neville Chemical Co.	Front Cover
New Jersey Zinc Co.	76
Newport Industries, Inc. (Heyden Newport Chem. Corp.)	July
Nopco Chemical Co.	67
Nuodex Products, Inc.	July
Oronite Chemical Co.	17
Pacific Vegetable Oil Co.	56
Patterson Foundry & Machine Co.	3
Pennsylvania Industrial Chem. Corp.	88
Phillips Petroleum Co.	23
Photovolt Co.	98
Pittsburgh Coke & Chemical Co.	22
R-B-H Dispersions Co.	93
Reichhold Chemicals, Inc.	2nd Cover
Rohm & Haas Co.	21
Ross & Rowe	July
Chas. Ross & Son Co.	July
St. Joseph Lead Co.	60
Shawinigan Resins Corp.	29
Shell Chemical Co.	6
Shell Oil Co.	19
Skelly Oil Co.	50
Socony Mobil Oil Co., Inc.	July
Sparkler Mfg. Co.	94
Standard Ultramarine & Color Co.	68
Titanium Pigment Co.	75
Troy Chemical Co.	70
Troy Engine & Machine Co.	4th Cover
Union Carbide Corp.	10
U. S. Stoneware Co.	28
Van Ameringen-Haebler, Inc.	89
Velsicol Chemical Corp.	25
C. K. Williams & Co.	83

PHOTOVOLT

pH Meter MOD. 115

A full-fledged line-operated pH Meter of remarkable accuracy at the unprecedented price of $145.-

(complete incl. electrodes)

Write for Bulletin #225 to

PHOTOVOLT CORP.

95 MADISON AVE NEW YORK 16, N. Y.

Have You Ordered Your Subscription To

PAINT and VARNISH PRODUCTION

If you wish to have PAINT and VARNISH PRODUCTION mailed to you every month, just send your remittance today.

Only $3.00 per year

$5.00 for Two Years

Valuable, practical articles in every issue by leading experts in their fields on all phases of paint and varnish production! Don't miss any issues . . . enter your subscription now!

Make checks payable to

POWELL MAGAZINES, INC.

855 Avenue of the Americas

New York 1, N. Y.

New CYZAC Resin 1013 rolls on, bakes hard and flexes with post-forming steel sheet!*

Take the fast cure, hardness and impact resistance of CYZAC Resins. Add a generous dash of superior flow and even greater flexibility. Mix in as a vehicle for your roller-coat enamel formulations.

It rolls on sheet-stock evenly and smoothly. It bakes hard in 15 minutes at 300° F! And it won't lose its grip or crack its sharp gloss even when stock is post-formed into intricate shapes!

What more could you ask in a finish for pre-coated steel sheet for file cabinets, venetian blinds, metal awnings, metal closures and the like? Why not look into CYZAC 1013 today? Write for data sheet and formulation information.

CYANAMID

Plastics and Resins Division

AMERICAN CYANAMID COMPANY
PLASTICS AND RESINS DIVISION
34F Rockefeller Plaza, New York 20, N. Y.

In Canada: **Cyanamid of Canada Limited, Montreal and Toronto**

Offices in: Boston • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Detroit • Los Angeles • Minneapolis • New York • Oakland • Philadelphia • St. Louis • Seattle

TROY

TROY Est. 1870

DUPLEX DISPERSER*

Produces Finished Product in One Operation

Compact unit combines powerful disperser head with rugged diamond-shaped agitator to produce finished batches *without further milling* for the majority of inks and paints. Modern design gives proportional hydraulic shear, kinetic impingement and mulling action for better wetting, improved color dispersion, and uniform blending.
Send samples for trial processing.

*Trademark—Patent Pending

COLLOID MILL

With Triple Action Design

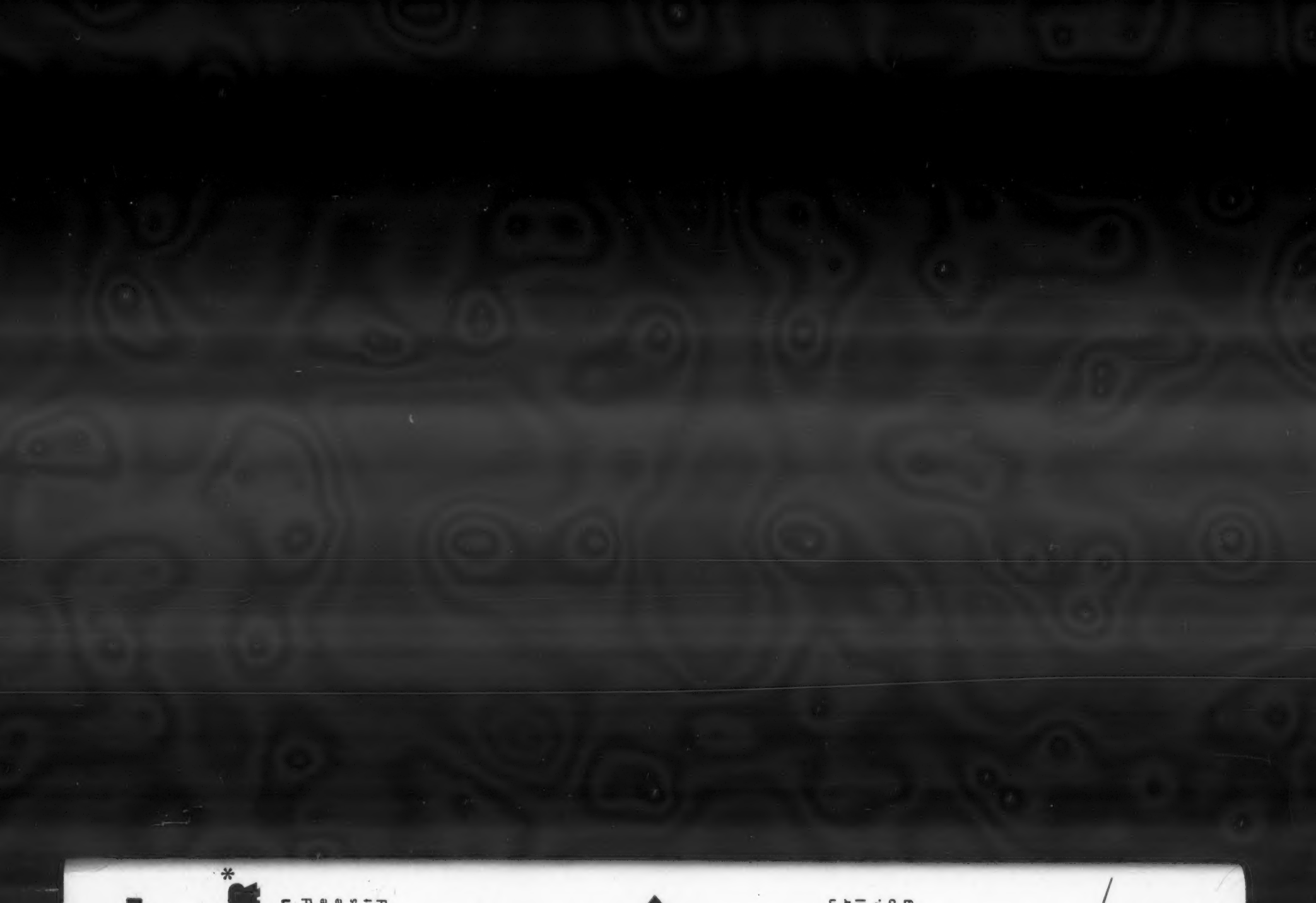
Utilizes three zones of action — at upper face of rotor, between peripheral surface of rotor and housing, and between under face of rotor and housing — for better emulsions and finer dispersions. Unit design prevents aeration of materials. Clearances adjustable while unit is in operation by calibrated adjusting ring.

ROLLER MILL

With *One Point* Adjustment "Floating Roll" Principle

For high speed precision-controlled dispersion and grinding of ink, paint, coatings, and similar products. Floating Roll principle minimizes roll deflection, gives maximum grinding surface. Exclusive one-point adjustment speeds clean-up time and provides quick, accurate resetting of rolls.

Write TODAY for new 1958 TROY Processing Equipment Catalog and name of your nearest dealer.

TROY Engine & Machine Co.
Parsons Street, Troy, Pennsylvania Tel: Troy 32

Send Sample of Your Material for Trial Processing. No Obligation.